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IN THE

SUPREME COURT OF THE UNITED STATES

No. [redacted] 24

CONCRETE MIXING & CONVEYING COMPANY (a Corporation),
Plaintiff-Petitioner,

vs.

R. C. STORRIE & COMPANY (a Partnership),
Defendants-Respondents.

BRIEF FOR PLAINTIFF-PETITIONER.

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IN THE

SUPREME COURT OF THE UNITED STATES

No. 528.

CONCRETE MIXING & CONVEYING COMPANY (a Corporation),
Plaintiff-Petitioner,

vs.

R. C. STORRIE & COMPANY (a Partnership),
Defendants-Respondents.

BRIEF FOR PLAINTIFF-PETITIONER.

Statement.

This cause comes before your Honors by writ of certiorari.

The judgment to be reviewed is that of the Circuit Court of Appeals for the Ninth Circuit holding invalid the McMichael patent No. 1,127,660, granted February 9, 1915. The patent (Exhibit Book, p. 4) pertains to the pneumatic transporation and placement of concrete. The means of this patent is used, practically to the exclusion of all other devices, for placing concrete linings in tunnels and subways.

The opinion of the Ninth Circuit Court of Appeals (R.,

pp. 666-678) is reported at 27 Fed. (2) 838. The trial court opinion herein (R., pp. 610-622) is reported at 23 Fed. (2) 131.

The opinion of the Ninth Circuit Court of Appeals is in conflict with **two** prior decisions[1] of the Second Circuit Court of Appeals finding the McMichael patent valid, viz., *Concrete Mixing & Conveying Company* v. *Ulen Contracting Corporation et al.*, 12 Fed. (2) 929-931 (Circuit Judges Rogers, Hough and Mack), and *Concrete Mixing & Conveying Company* v. *Powers-Kennedy Contracting Corporation et al.*, 27 Fed. (2) 668 (Circuit Judges Manton, Learned Hand and Swan).

Plaintiff-petitioner, Concrete Mixing & Conveying Company, an Illinois corporation, the owner of the McMichael patent, has been engaged for many years, both directly and through its principal licensee Ransome Concrete Machinery Co., in the manufacture and distribution of pneumatic concrete placing machines embodying the McMichael invention (R., pp. 94 and 124).

Defendants-respondents, a partnership, having a place of business in the City of Seattle, are charged with infringement of claims 1, 2, 17, 18, 24, 29, 34 and 35 of the McMichael patent by the use, at the Skagit River Project of the City of Seattle, of machines like the one shown in the drawing, Plaintiff's Exhibit 13 (Exhibit Book, p. 84), and the one shown in the Hackley patent application drawing forming part of Plaintiff's Exhibit 12 (Exhibit Book, p. 74). The drawing, Exhibit 13, shows an early form of the respondents' (Hackley) machine as used at the Skagit River Project, whereas the Hackley patent application shows a later and slightly modified or improved machine which was used on the

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1 The decisions of the Second Circuit Court of Appeals in the Ulen and Powers-Kennedy cases, and the trial court opinions in those cases are set forth in full in the "Appendix" to the petition for certiorari in the instant case.

same job. The two accused machines are substantially identical. They differ only with respect to the specific way in which the air pressure pipes enter the machine receptacle.

Lower Court Proceedings.

The proceedings of this case in the trial court and in the Ninth Circuit Court of Appeals are set forth at pages 6 and 7 of the petition for certiorari in this case.

The proceedings had in the trial courts and in the Second Circuit Court of Appeals in the cases of petitioner *vs.* Ulen Contracting Corporation *et al.*, and Powers-Kennedy Contracting Corporation *et al.*, are set forth at pages 8 to 10, inclusive, of the petition for certiorari herein.

Questions Presented.

The salient questions (as presented by the petition for certiorari) are:

1. Was the Circuit Court of Appeals for the Second Circuit right when, in the suits of your petitioner versus (1) Ulen Contracting Corporation *et al.*, and (2) Powers-Kennedy Contracting Corporation *et al.*, it found the McMichael patent[1] valid; **or**

Was the Circuit Court of Appeals for the Ninth Circuit

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[1] Claims 2, 17, 34 and 35 of the patent were involved in each of the Courts of Appeals cases, being twice found valid by the Second Circuit Court of Appeals and being held invalid by the Ninth Circuit Court of Appeals. In addition claims 4, 6, 21, 22 and 28 were involved in the Second Circuit cases, and claims 1, 18, 24 and 29 in the Ninth Circuit case. *All claims before the Second Circuit Court of Appeals were held valid, and all claims before the Ninth Circuit Court of Appeals were held invalid.* The conflict between the two Courts of Appeals is fundamental, and is entirely independent of the fact that each of the Courts of Appeals had before it a few claims of the patent which did not happen to be before the other court—due chiefly, of course, to minor differences in the defendants' structures charged to infringe.

right when, in the present case, it held the McMichael patent to be invalid?

2. Was the Circuit Court of Appeals for the Second Circuit right in rejecting the Smith patent No. 122,498 of 1872 as a reference against the patent in suit, and in regarding the peculiar combination of static and velocity air pressure means, including the nozzle "which injects air into the concrete at its entrance into the discharge outlet" as distinguishing the McMichael invention from all prior devices not including such a combination and such a nozzle; **or**

Was the Circuit Court of Appeals for the Ninth Circuit right in finding the McMichael patent anticipated by,

(*a*) The Smith patent—*which admittedly discloses no such combination and no nozzle of any kind.*

(*b*) The alleged 1905 experiment of Thomas Leake—*which admittedly had no such combination and no nozzle of any kind,* and was supported only by a single uncorroborated and unsubstantiated deposition.

(*c*) The British Patents to Duckham Nos. 4,400 of 1875 and 15,348 of 1885—disclosing machines which for *many* reasons are structurally incapable of handling concrete, and which patents, while making passing reference to certain *unillustrated* air and water agitator nozzles for stirring mud, do not describe the *location* of any kind of a nozzle in the *position* required by the McMichael patent and which years of practical experience with McMichael's machine have demonstrated is essential to the success of a pneumatic placer of concrete?

3. Was the Circuit Court of Appeals for the Ninth Circuit right when it regarded your Honors' decision in

the case of *Concrete Appliances Co.* v. *Gomery*, 269 U. S. 177, as affording a basis upon which to hold the McMichael patent invalid; **or**

Was the Circuit Court of Appeals for the Second Circuit right when (in the Powers-Kennedy case) it distinguished the facts and principles in these suits involving the McMichael patent from the facts and legal principles involved in the Gomery case?

4. Was the Circuit Court of Appeals for the Ninth Circuit right in holding that the alleged prior invention and public use of McMichael's invention by one Thomas Leake was established by the verbal testimony of one witness, given more than twenty years after the alleged event and uncorroborated by any other witness, or by any contemporary device, drawing, photograph or other visible or tangible evidence; **or**

Was the Circuit Court of Appeals for the Second Circuit right when (in the Powers-Kennedy case) it applied the established rule of the Supreme Court, as set forth in *Deering* v. *Winona Harvester Works*, 155 U. S. 286, 300, and many other cases, that an alleged prior invention or public use to defeat an issued patent must be **"proven by evidence so cogent as to leave no reasonable doubt in the mind of the court"**?

5. Was the Circuit Court of Appeals for the Ninth Circuit justified in attaching importance to the alleged 1905 experiment of Thomas Leake, notwithstanding Leake's testimony that the experiment was **discarded and abandoned** immediately after it was made; **or**

Was the Circuit Court of Appeals for the Second Circuit right when (with reference to the alleged prior public use testified to by Artingstall *et al.* in the Powers-Kennedy case) it said:

"Such casual and abandoned uses do not contrib-

ute to the stock of knowledge which makes up the art. If we may invalidate a patent upon such prior uses so proved, no patent would be safe''?

6. Was the Circuit Court of Appeals for the Ninth Circuit justified in accepting as competent evidence, relative to the alleged prior invention and use by Thomas Leake, certain statements appearing in a Patent Office preliminary statement (*ex parte* affidavit) made by Leake more than a year after McMichael's filing date, and certain statements made more than a year after McMichael's filing date, in Leake's patent application, by Leake's *attorney* (not called as a witness) **or**

Is such evidence inadmissible because unfair and incompetent (as your petitioner contends), being the kind of unfair and incompetent evidence which was strongly condemned by the Circuit Court of Appeals for the Second Circuit in *General Electric Co.* v. *P. R. Mallory & Company*, 298 Fed. 579, 586?

7. Was Judge Bourquin (and inferentially the Ninth Circuit Court of Appeals) right in finding that defendants-respondents' machines do not infringe the McMichael patent; **or**

Was the Second Circuit Court of Appeals (and Judge A. N. Hand) right in finding the McMichael patent infringed by machines which are substantially the same as the machines used by the respondents in this case?

The Problem Which McMichael Solved.

Concrete is a mixture of rock, sand and cement with a varying quantity of water, preferably only sufficient water to wet the aggregates and hydrate the cement. It is approximately as heavy as solid rock, and when set forms artificial rock. These aggregates must be thoroughly mixed and proportioned, and the mixture must be

so intimate that each piece of rock and each particle of sand is thoroughly covered with cement. This intimate mixture must be so handled that the aggregates are in no way separated from each other between the point where they are mixed and the point where the concrete is ultimately placed.

Pneumatic conveyors were, of course, known before McMichael made his invention, but prior to the McMichael invention there was no pneumatic conveyor which in practice could successfully be used for transporting concrete, and there was no pneumatic conveyor which operated in accordance with the plan or principle which is characteristic of the McMichael machine and which is of the essence of the McMichael invention.

All of the pneumatic conveyors which were known prior to the McMichael invention fall into either one or the other of two generic classes. Firstly, there was that class of conveyor wherein the conveyed materials are carried along a conduit in suspension by the kinetic energy of an air stream. Secondly, there was that class of conveyors wherein air is applied to a liquid, or to a fluid mixture of a liquid and entrained solids, to cause the liquid or fluid mixture to flow as water flows through a hose or pipe or as tooth paste emanates from its collapsible container.

Neither of these well known old style types of conveyor was suitable for conveying concrete. If McMichael had merely attempted to convey concrete by utilizing one or the other of these old style types of conveyor which were known prior to his invention, his efforts to transport concrete pneumatically would have proved a failure and the lining of tunnels, subways and the like, would, in all probability, still be accomplished by the expensive and unsatisfactory hand methods which were in vogue prior to the advent of his invention.

Conveyors which cause the conveyed materials to be carried along in suspension by the kinetic energy of an air stream serve very well to transport materials such as grain, ashes, excavated materials, etc., where separation of the materials is a matter of no consequence, but such a conveyor would be worse than useless if applied to the transportation of concrete. It would cause separation of the rocks, sand, cement and water which constitute concrete, and would undo the thorough mixing which all engineers are agreed is absolutely essential to concrete. Moreover, the quantity and velocity of air required to hold such heavy materials as rocks in suspension would entail such an extravagance of power for the supply of compressed air as to render such a plan wholly uncommercial. With any available pressure and any practicable strength of conduit nothing would result but a piling up, a jamming and a plugging up of the entire apparatus.

A conveyor which causes a liquid, or a fluid mixture of liquid and entrained solids, to flow through a pipe is totally unsuitable for the conveyance of concrete, because of the characteristics of concrete. Concrete will not flow through a pipe; at least with any certainty. It is a mass of heavy solids, usually only moderately wet. It has an inherent tendency to bridge or arch[1] in contracting parts of the hopper and in the conduit itself, and thus to jam and block any conduit through which an attempt may be made to cause it to flow.

McMichael was confronted with the problem of conveying a material, concrete, which for very practical reasons, could not be carried in suspension in an air stream and which would almost invariably jam and clog in any

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1 By "bridging" or "arching" as these words are used in the record herein is meant the piling and wedging of pieces of rock against each other in such a way as to create a stoppage.

pipe through which an attempt might be made to *flow* it by pressure applied behind it.

We now know that the types of pneumatic conveyor known prior to McMichael were unsuitable for his purpose. McMichael is dead and, therefore, cannot tell his story as to the development of his invention, but it is clear that he discarded the old types of conveyor, if he ever attempted to use them, and resorted to a novel principle of operation which results from a definite arrangement of the various parts of his apparatus,—an arrangement which is clearly defined by the claims in suit and which has been followed in the respondents' (Hackley) machines.

To solve the problem of lifting, conveying and placing heavy concrete—sometimes called rock in the making—by air would seem to be sufficient to sustain any patent. To do this and keep the accurately and intimately mingled, yet uncombined, coarse and fine aggregates from separating, was evidently too great a problem for any engineer or inventor up to McMichael's time. Yet McMichael solved this problem in a manner so simple, complete and effective that now, many years after his application for patent, we find his invention in universal use and no other solution suggested.

The McMichael Apparatus.[1]

The McMichael apparatus involves:

(*a*) A closed chamber, in which a heavy mass of concrete forming materials may be placed, said chamber comprising a portion which gradually tapers or converges toward a discharge conduit;

(*b*) Means for establishing air pressure upon the

[1] The patent appears at Exhibit Book, page 4. Commercial forms of the McMichael apparatus are shown at Exhibit Book, pages 90 and 111.

mass of concrete within the chamber to crowd and pack it into the tapering portion of the chamber and toward the discharge conduit; **and**

(*c*) An air nozzle discharging **at the point where the mass packs**, due to the pressure behind the mass and the converging walls of the chamber, to detach or cut off slugs, or successive portions of the mass, and send them along the conduit *under pressure* without any substantial separation of the rocks, sand and cement constituting such slug or detached portion.

McMichael appreciated or ascertained that he could detach sub-masses or slugs from a compacted mass of concrete. He, therefore, provided his receptacle with a tapering portion anterior to the conduit and supplied air pressure to his receptacle behind the mass in order to crowd and pack the concrete into the tapering portion of the receptacle. The net result of the pressure behind the mass and the converging walls of the chamber is a compacted mass of concrete at the very beginning of the discharge conduit.

McMichael then did the thing which experience has demonstrated was a master stroke. **He applied a velocity jet of air to the concrete compacted at the point where the chamber merges into the conduit** so that the jet would successively detach portions or sub-masses of the compacted concrete and cause them to travel along the conduit as piston-like parcels, which do not suffer any substantial separation of the aggregates of which they are composed.

The location of the velocity jet at the very point where the concrete becomes compacted in passing from the chamber into the conduit is of the very essence of the McMichael invention. Regardless of whether or not respondents disagree, or pretend to disagree, with McMichael's explanation of the mode of operation of his

machine, they cannot seriously deny that the location of the velocity jet, precisely as McMichael located it, is absolutely essential in a machine which is to transport concrete successfully and without separating its aggregates.

The McMichael Apparatus Eliminates Hand Tamping and Insures Better Concrete Than Can Be Secured By Any Other Means. This Is One of the Reasons Why the McMichael Apparatus Is Used to the Exclusion of All Others in Tunnel Work.

Prior to the McMichael invention, tunnels were lined entirely by hand, that is, by shoveling the concrete to position behind the tunnel forms and then *tamping* the concrete so far as was possible, by projecting the end of a shovel, a stick or a tamping bar into the space between the forms and the rough wall of the tunnel.

Of course, it is practically impossible effectively to hand tamp concrete which has been placed behind tunnel forms. The walls of the tunnel, particularly when cut through rock as is customary, are jagged and literally filled with large and irregularly shaped crevices. It is impossible for a workman standing at the open end of a tunnel form, to tamp concrete into these irregular crevices. As a result, concrete, *as hand placed and hand tamped* prior to the McMichael invention was of uncertain density, frequently contained voids and never completely filled the crevices in the rough tunnel walls (R., p. 107).

The McMichael apparatus eliminates the necessity for hand tamping and insures the formation of a well packed, dense concrete, which completely fills the space between the forms and the rough wall of the tunnel, and which is projected under pressure into all of the crevices in the

tunnel wall. This is so because the McMichael apparatus delivers concrete to the forms with such *momentum* that the concrete is automatically packed much more effectively than could be accomplished by any amount of hand tamping.

The effectiveness with which the McMichael apparatus packs the concrete which it delivers is due almost entirely to the peculiar way in which the McMichael apparatus functions,—*i. e.*, by delivering the concrete in successive slugs or parcels which are projected behind the tunnel forms with great *momentum*,—the product of mass and velocity. No conveyor of the prior art,—whether it be one of the conveyors which caused the conveyed materials to be floated along by the kinetic energy of an air stream, or whether it be one of the conveyors which caused mixed and entrained solids to flow in a liquid, could possibly deliver any material with the *momentum* which enables the McMichael apparatus to form perfect concrete without any necessity for hand tamping. In this connection, the testimony of Mr. Kirkland (R., p. 107) is very instructive. Mr. Kirkland testified as follows:

> "Q. When the concrete is conveyed through the duct or conduit of the McMichael apparatus and reaches the form or the key of a tunnel arch in which the concrete is to be set, what is the effect of the discharge of that concrete upon the concrete itself—the quality and characteristics of the concrete?
>
> "A. The concrete, weighing perhaps a ton is discharged from the end of the pipe into a tunnel form where concrete has been previously put, and discharges into the previously placed concrete with such force, going perhaps 60 miles an hour that it gives it a tremendous shock so that the whole mass will quake and it makes a very dense mixture and packs it in solidly.
>
> "Q. How does concrete thus formed by the use of this method and apparatus compare in quality with

concrete formed by hand manipulation—put in place by hand and tamped by hand?

"A. Concrete tamped by hand is very likely to be porous whereas pneumatic concrete is very dense and fills up the spaces against the rock much more tightly than could possibly be done by hand; also in tunnels where there is timber used, it is necessary to pack in the concrete in all the vacant spaces. . . .

"Q. How far into a form can concrete be placed or thrown by hand processes and tamped?

"A. Just as far as a man can reach with a stick or shovel to tamp it with.

"Q. How far is that?

"A. A few feet—three or four feet.

"Q. How far can—is concrete carried from the end of the discharge duct of the McMichael apparatus to the place in the form at which it is to set?

"A. About 20 feet. The end of the pipe is usually carried to within 20 feet of the rear of the forms.

"Q. Is the pipe carried over the form and between the form and the rough interior of the excavated tunnel?

"A. Yes, sir."

The Slug Theory.

McMichael in his patent carefully pointed out what he believed to be the mode of operation of his machine. McMichael's explanation or "slug theory" as it has been called, has been recognized by the Patent Office, by engineers generally, and by the courts of the Second Circuit, as a very sound and logical explanation of why McMichael is able to transport heavy concrete by air through pipes, even for great distances, without separating the aggregates of which it is composed. It is the only theory ever advanced which is compatible with the accomplished fact that McMichael's machine does transport concrete by air without separating the aggregates thereof.

Of course, the respondents' counsel in this case, as did the defendants in the Second Circuit cases, scoff at the slug theory. But respondents do not, because they cannot, advance any counter theory which is reconcilable with the fact that machines embodying the McMichael invention (respondents' as well as petitioner's) do transport concrete by air without separating its aggregates.

In the appendix to this brief we have carefully considered the petitioner's tests which substantiate the slug theory and the test made by respondents which is said to disprove that theory. We think it abundantly appears that the slug theory is sound. The important thing to be borne in mind, however, is that McMichael does transport concrete by air without separating its aggregates. He does this because his apparatus operates differently from the conveyors of the prior art. He does this because of some peculiar way in which the several parts of his apparatus co-operate to prevent blocking and the separation of the aggregates. Respondents want to get and do get McMichael's result. *That is why they place their velocity nozzle exactly where McMichael taught that it should be placed* and that is why respondents utilize each and every other essential feature of McMichael's machine.

Even if McMichael, the Patent Office Examiners, eminent engineers and the Judges of the Second Circuit, were wrong as to the theory of operation of McMichael's machine, still respondents have used like apparatus, essentially different from any prior device, and accomplish the same result upon whatever principle or theory these like machines may operate.

The Second Circuit Court of Appeals, in deciding the Powers-Kennedy case, hit the nail on the head when, in referring to the dispute about the "slug theory," it said:

"To us the dispute seems irrelevant. The patent

says nothing which commits the patentee to the slug method of operation. . . . But whether the concrete goes forward as we imagine or in some other manner, there is no sufficient reason to suppose that defendants' machine does not operate in the same manner as plaintiff's whatever that manner may be." (27 Fed. (2) 670.)

The Patent Does Not Cover a Theory. The Correctness of the Inventor's Statement of the Theory of the Invention is Unimportant.

Assuming for the sake of the argument that the respondents contentions in regard to the so-called "slug theory" are correct and that the machine invented by McMichael does not in fact operate upon the theory that he thought it did, such a situation will not vitiate McMichael's patent. McMichael sought to arrive at a new result—that of conveying and placing concrete, without separation of its aggregates, by the use of compressed air. His patent discloses an operative machine which achieves the result sought. This is all that the law requires. The law does not require that the practical minded mechanic who invents a new machine shall know the complex and oftentimes obstruse theory upon which his machine operates.

McMichael would have been entitled to his patent had he never heard of the now controverted "slug theory." His patent does not and cannot cover a theory of operation. It must and does cover the *means* for arriving at a result. This being true, McMichael should not be deprived of the protection to which he is entitled under his patent merely because he, or his patent solicitor, was a man of sufficient intelligence to work out a reasonable hypothesis to explain the functionings of his machine. (And this is true even though his hypothesis may not have been the correct one.)

To hold that a patent is invalid because the inventor does not understand or misstates the theory of operation of his machine would result in invalidating a large part of all patents issued. To hold that a patent is invalid because of the inventor's faulty conception of the theory upon which his machine operates would mean that the theory and not the practical means of arriving at a result is the thing which is patentable. Indeed, this would be a peculiar construction of a statute which says that the things which are patentable are an "art, machine or manufacture." It is absurd to read into this statute the added fertile field of "theories." If patents are to be held invalid because of the inventor's erroneous conception of a theory of operation to explain his invention, then it follows that it is the theory which is patentable and any exponent of a new theory would be entitled to a patent for that theory itself, regardless of its practicability.

The Supreme Court has discussed this matter in its opinion in the case of *Diamond Rubber Company* v. *Consolidated Rubber Tire Co.*, 220 U. S. 428 (1910), where, on page 435 U. S., it is stated:

> "A patentee may be baldly empirical, seeing nothing beyond his experiments and the result; yet if he has added a new and valuable article to the world's utilities, he is entitled to the rank and protection of an inventor. **And how can it take from his merit that he may not know all of the forces which he has brought into operation? It is certainly not necessary that he understand or be able to state the scientific principles underlying his invention, and it is immaterial whether he can stand a successful examination as to the speculative ideas involved.** (Citing numerous authorities.) He must, indeed, make such disclosure and description of his invention that it may be put into practice. In this he must be clear. He must not put forth a puzzle for invention or experiment to solve, but the description is sufficient if

those skilled in the art can understand it. This satisfies the law, which only requires as a condition of its protection that the world be given something new and that the world be taught how to use it. It is no concern of the world whether the principle upon which the new construction acts be obvious or obscure, so that it inheres in the new construction."

The Commercial Success of the McMichael Apparatus.

The evidence herein shows that McMichael's apparatus revolutionized the art of placing concrete in tunnel linings, and, solely by reason of its great merit, has achieved remarkable commercial success in the hands of petitioner and its licensee, the Ransome Concrete Machinery Company.

Practically every tunnel of consequence constructed within recent years has been lined with the McMichael apparatus (R., pp. 101 and 103).

Kirkland, chief engineer of Concrete Mixing and Conveying Company, and Robinson, sales manager of the Ransome Company, testified concerning the many large tunnels in connection with which the McMichael apparatus has been or is being used (R., pp. 99 and 124) and each of these witnesses produced a list of the more important tunnel projects for which the Concrete Mixing and Conveying Company and the Ransome Company have furnished the McMichael apparatus (see lists, Exhibit Book, pp. 92 and 96).

Prior to the advent of the McMichael invention, tunnels were lined by hand. Concrete was shoveled and tamped by hand behind the tunnel forms. Progress was slow and expensive. The McMichael apparatus will line a tunnel in but a fraction of the time required for hand placement, and will do a much better job, because it carries the concrete to its final position with great momen-

tum and packs the concrete so tightly that hand tamping is not required.

The McMichael apparatus not only entirely displaced the former hand methods of concrete placement in tunnel linings and like situations, but in so doing, reduced the cost of placing it by one-third to one-half (R., p. 101).

All in all, the testimony in this case, as did the testimony in the Second Circuit cases, fully justifies the statement of Judge Augustus N. Hand, in his opinion in the Ulen case, that:

> "The McMichael invention is a most interesting one and has apparently met with general acceptance.
>
> . . .
>
> ". . . His device has displaced all other methods for rapidly and economically conveying, lifting and placing concrete at long distances from the initial source of supply, and has been used in numerous great enterprises." (12 Fed. (2) 931.)

The Great Success of the McMichael Machine in Practical Use Is Persuasive Evidence that McMichael Was An Inventor and Entitled to the Protection of the Patent Law.

The great practical value of the McMichael machine and the commercial success which it has achieved are very persuasive evidence that McMichael exercised invention in its production.

In the case of *Eibel Process Co.* v. *Minnesota & Ontario Paper Co.*, 261 U. S. 45, 56, 43 Sup. Ct. Rep. 322, this court, by Mr. Chief Justice Taft, said:

> "The fact that the Eibel pitch has thus been generally adopted in the paper making business, and that the daily product in paper making has thus been increased at least 20 per cent. over that which had been achieved before Eibel, is very weighty evidence to sustain the presumption from his patent that what he discovered and invented was new and useful."

And he also says:

> ". . . and the final fact that, when he made known his discovery, all adopted his remedy, leave no doubt in our minds that what he saw and did was not obvious, and did involve discovery and invention."

THE PATENT IN SUIT.[1]

The Patent Describes and Claims the Invention Fully and Accurately.

An understanding of the subject-matter of the McMichael patent can easily be arrived at by quoting some of its characteristic claims. Eight claims (1, 2, 17, 18, 24, 29, 34 and 35) are involved in suit. We shall quote but two of them.

Claim 2 reads as follows:

> "2. In combination, a chamber for containing concrete forming materials, a conduit leading therefrom, a compressed air inlet pipe connected to a part of the chamber remote from the conduit, and another compressed air inlet pipe leading through the chamber wall and terminating **within the chamber near the opening into the conduit** in a nozzle **directed toward** said opening."

Claim 17 (another of the claims in suit) refers more specifically to the peculiar construction and arrangement which produces the effect of detaching and delivering the mass in "*successive portions.*" It reads:

> "17. In a device for treating and moving a mass of concrete forming materials, the combination of a chamber for receiving and containing the said mass, a discharge duct connected with the chamber, an air inlet pipe connected with the chamber, means for preventing the flow of air or materials, out of the chamber except through the discharge duct, means for supplying air under pressure through the said

[1] The patent appears at page 4 of the Exhibit Book.

pipe to the chamber back of the mass of materials therein to push the said mass toward and into the discharge duct, and means for causing a jet of air to inpinge upon **successive portions** of the mass in the general direction of the discharge duct to directly assist their movement therethrough."

The material—concrete—to the handling of which the improvements are appropriated, and limited by the patent, is defined as follows (Spec., p. 2, lines 100-108):

"As is well known, the material referred to as concrete is a composition containing relatively large pieces of rock or stone, as uniform in size as possible, together with predetermined proportions of sand, cement and water. The purpose of this composition is, ultimately, to have, in a desired position, a hard rock-like body which will resist disintegration and fracture."

This material may be mixed in any desired proportions, and may be of any desired consistency, but one of the objects of the invention is to enable the user to use a *relatively stiff or "dry" concrete mixture,* in which a minimum of water is employed, as that has been considered the ideal mixture for many years. Thus the specification says (p. 3, lines 42-55):

"One of the important advantages incident to the use of a device embodying my invention is that this undesirable excess of water can be reduced to a minimum *or entirely eliminated,* satisfactory coating of the rock pieces being found to be possible when the binding material is *relatively stiff.* While an apparatus embodying my invention is *especially well adapted* for the handling of a mass of concrete forming elements containing *little* or *no* excess of water, it will be understood that its use is not limited to the handling of such a mass."

The operation of the invention is fully described in the specification, and particularly at page 2, lines 45-100, from which we quote in part:

"It will be observed that the upper air pipe 8

serves merely to supply air to the upper part of the chamber 1, the pressure of the air being uniformly applied over the entire upper surface of the mass. The lower pipe 10, however, serves to direct a jet of air moving at a considerable velocity directly against portions of the mass as they move toward and into the discharge duct. The two pipes thus act in very different ways, the upper pipe supplying air which acts by pressure and the lower pipe supplying air which acts by velocity. . . . Air from the lower pipe 10 may force itself into the body of the mass, and the relatively small air jet acting upon the relatively large stream of outward moving materials *directly engages with the sub-masses to push them along.*"

A further description of the construction and operation will be found elsewhere in the specification.

Referring to the drawing of the patent, 1 is the receiving chamber for the concrete, 2 the smooth, tapering portion leading to the outlet, 3 and 5 the charging opening and door respectively, 4 the head of the chamber, 6 an air reservoir, 7 the air compressor, 8 the pipe supplying compressed air near the top of the chamber and 9 the valve controlling it, 10 the air pipe for supplying the jet of air near the outlet of the chamber and 11 the valve controlling it, and 13 the discharge conduit.

In the embodiment shown in the patent, there is a small pipe 12 leading into the chamber for water, which "may be" used "as a lubricant" (Spec., p. 1, lines 99-102) and the discharge conduit has a U-bend 14 in it so that the concrete masses will be "more or less tightly packed" (Spec., p. 1, line 97), as they leave the chamber. Water is usually supplied before the concrete is placed in the chamber, and the U-bend is omitted in most cases, as the resistance of the discharge pipe has been found sufficient to pack the concrete. The bend, however, is still used by the petitioner in some cases (R., p. 122).

The conveying conduit shown in the patent extends up-

wardly, and in all or nearly all cases will extend upwardly more or less to reach the top of the tunnel or other work but it may extend entirely on a level (Spec., p. 4, line 82).

While the particular action of the invention in handling concrete is described in the patent and has been brought out fully in the testimony, to show that the invention involves a principle of operation **entirely its own**, the claims are not all limited to this precise mode of operation. **In a broad sense, the invention is characterized by the fact that it first reduces the concrete to a compact mass and then conveys and delivers it by combined pressure and nozzle action.** And it does this with relatively low air pressure, pressures of 80 to 100 lbs. per square inch being employed.

The Respondents' Apparatus Is a Complete Embodiment of the McMichael Invention and Is Operated in a Manner Which Fully Realizes All of the Advantages of the McMichael Invention.

The drawings opposite this page, show how completely the respondents have copied McMichael's invention.

The first drawing is taken from the McMichael patent. The second illustrates an early form of the respondents' apparatus which was used on the Skagit River job, and the third drawing, taken from the Hackley patent, shows a later machine also used by the respondents on the Skagit River job.

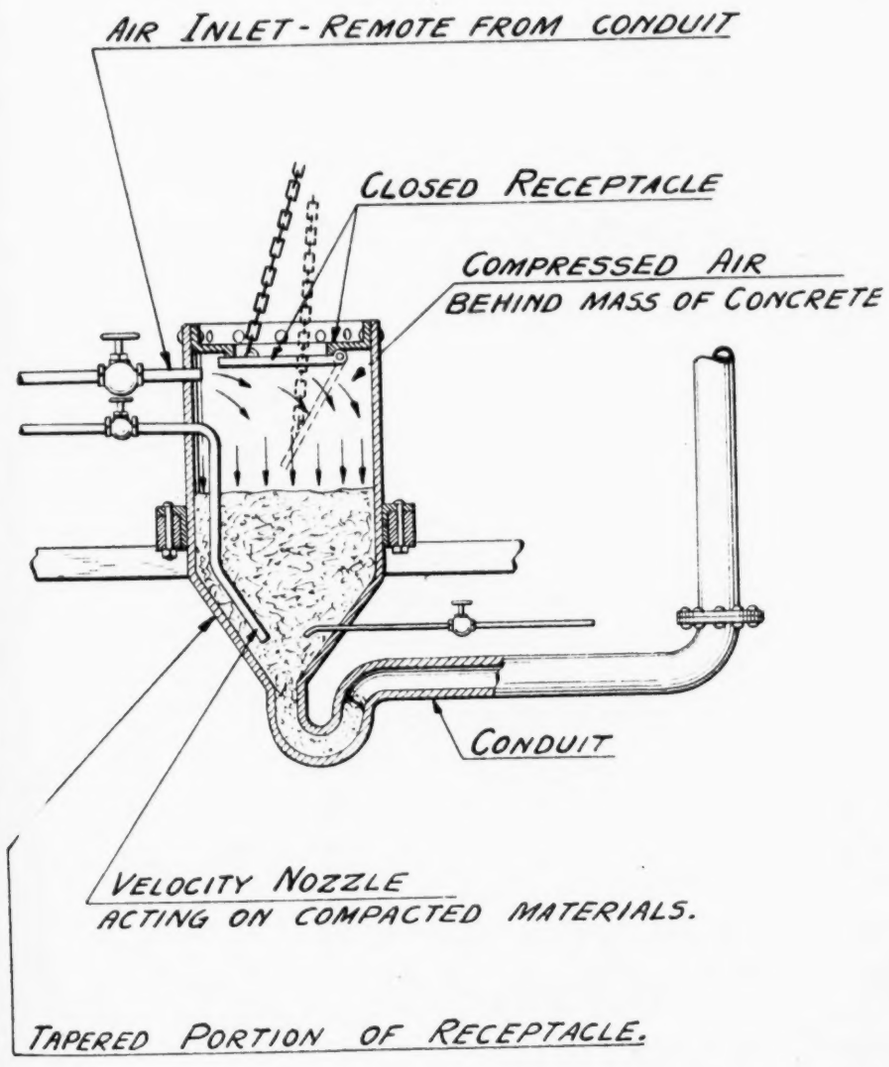
The apparatus of the patent is a "vertical" machine, whereas each of the respondents' machines is "horizontal." The horizontal type of machine is more convenient when the apparatus is used in tunnels having little head room. This form, along with the vertical type, is

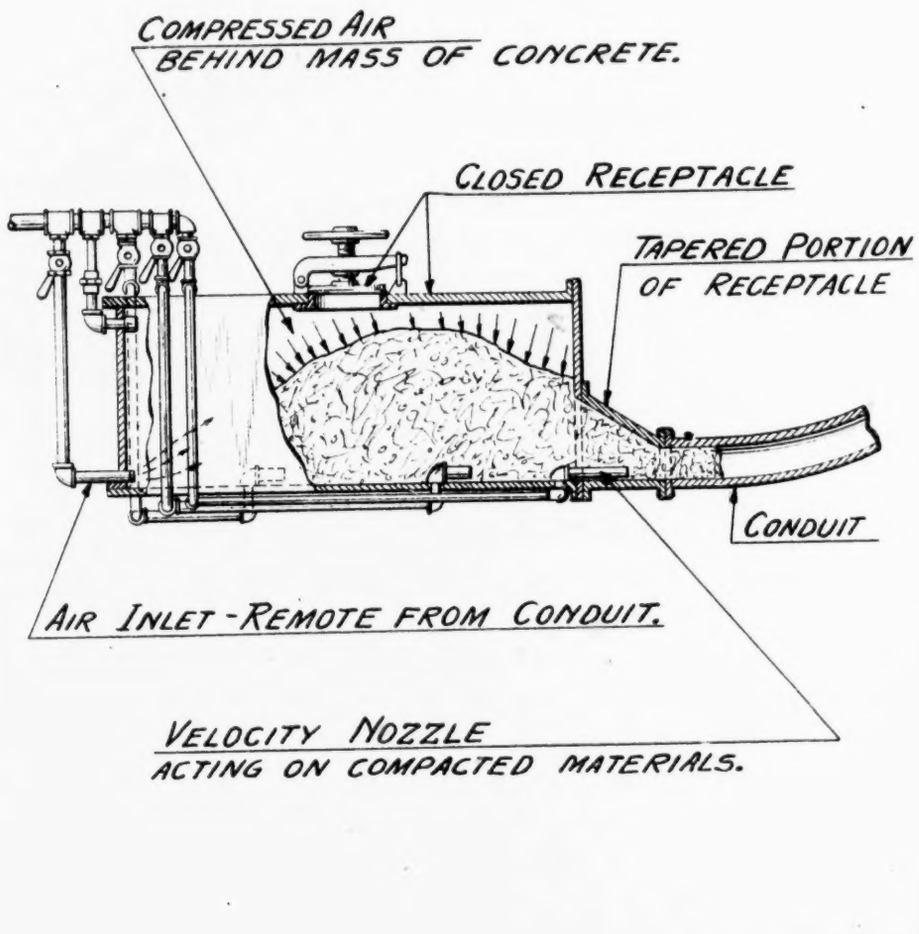
PATENT IN SUIT

RESPONDENTS'

I. THE MACHINE

OXENHAM SAW ON OCTOBER 10TH 1923
(RECORD P. 78)

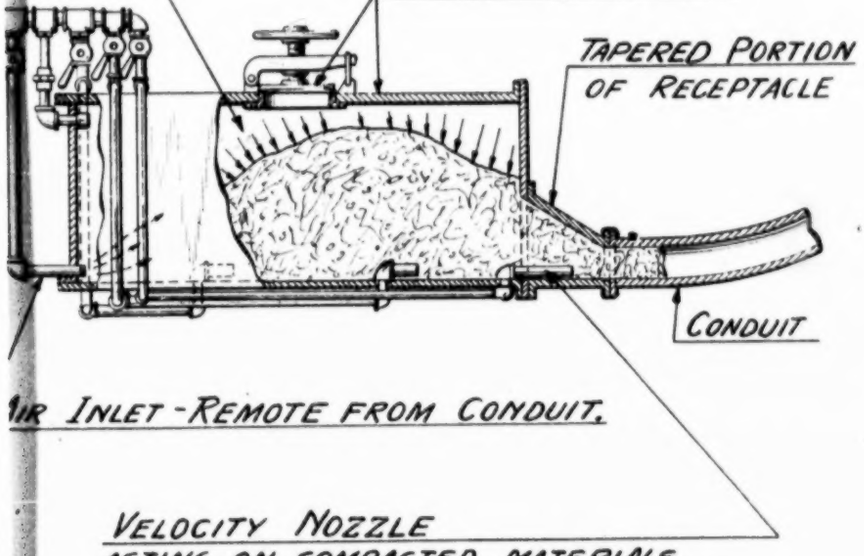




RESPONDENTS' APPARATUS.

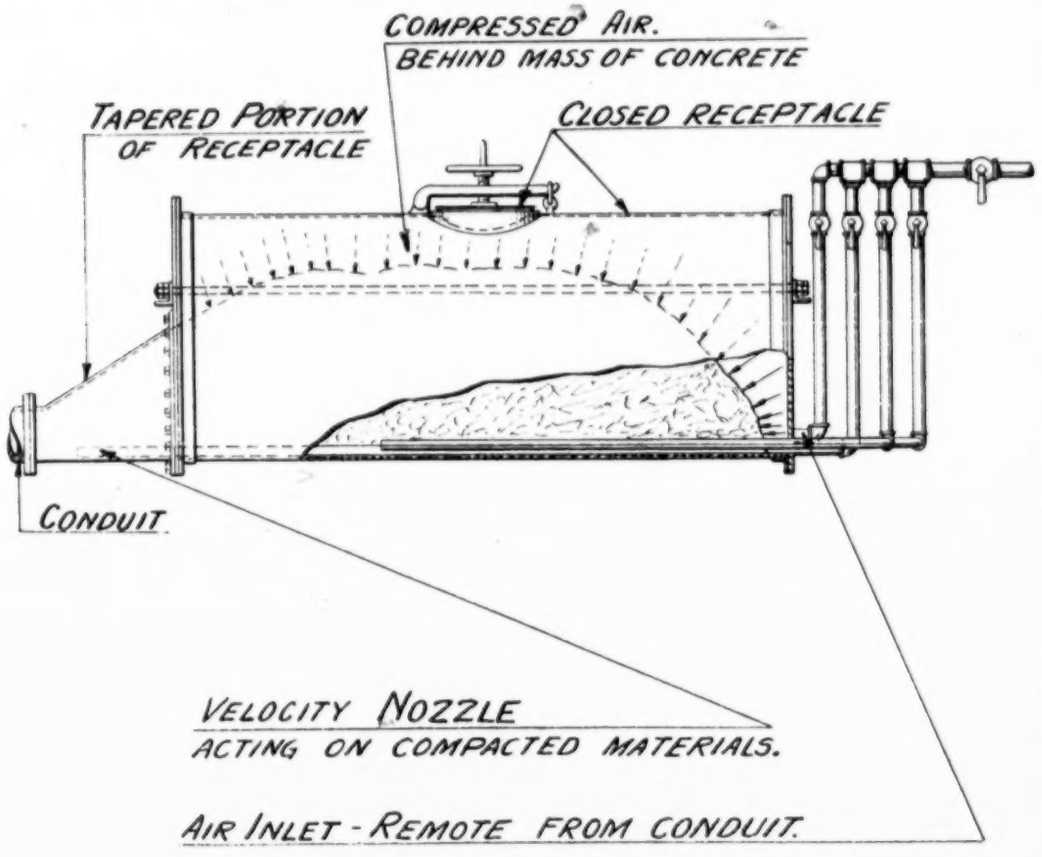
I. THE MACHINE

OXENHAM SAW ON OCTOBER 10TH 1923
(RECORD P. 78)



II. THE MACHINE

OF THE HACKLEY PATENT #1,619,297
(EXHIBIT BOOK P. 78)
ALSO USED BY RESPONDENTS
ON THE SKAGIT RIVER JOB.



also used by petitioner's licensee (see illustrations of Ransome Apparatus, Plaintiff's Exhibits Nos. 22 and 24—Exhibit Book, pp. 102 and 105). Furthermore, this "horizontal" type of machine is the kind of machine which Judge A. N. Hand, and the Circuit Court of Appeals for the Second Circuit, found to infringe the McMichael patent in the Ulen case (see drawing on page 181, Ulen R., Plaintiff's Exhibit 4).

It is perfectly obvious that, except for certain immaterial differences peculiar to the horizontal type, the respondents' (Hackley) machine is nothing more nor less than the device of the McMichael patent turned on its side.

Both the apparatus of the patent and respondents' apparatus comprise receptacles which converge or taper toward the discharge conduit. Each apparatus is provided with a sturdy door to permit the insertion of the concrete to be conveyed and to withstand the pressures which are created above and behind the mass of concrete when compressed air is admitted to the receptacle through the several compressed air pipes. *Each apparatus has a velocity nozzle disposed at the point which McMichael ascertained was the necessary point, i.e.,* the point at which the concrete is compacted, and where it tends to arch and jam, due to the influence of the pressure in the receptacle and its tapering walls. The devices are practically identical. As one operates so must the others.

It was suggested in the courts below that since in respondents' machines the air inlet pipes "remote from the conduit" are located in the lower part of the chamber, there might not be "pressure above the mass" of concrete in the chamber. It seems obvious, however, that air pressure must and does build up in the chamber, regardless of whether the air for this purpose is admitted at the top or at the bottom. Indeed, in the Powers-

Kennedy case, one of the machines used by the defendants relied solely upon air admitted through the velocity nozzle to build up a pressure above the mass of concrete in the chamber. Of this machine, Judge A. N. Hand in his opinion, correctly said:

> "There is undoubtedly a pressure behind the mass in defendants' machine far greater than ordinary air pressure and varying according to the freedom with which the air in the outlet tube is passing through it. . . . If this were not so, the high pressure through the discharge pipe would hold back the concrete." (Exhibit Book, p. 31.)

What Hackley, Respondents' Engineer, Said About the Identity of Respondents' Apparatus With That of McMichael.

If any reasonable doubt could exist as to the absolute similarity of the respondents' devices and that of the McMichael patent, the doubt would be dispelled by consideration of the very accurate description given of the respondents' (Hackley) machine by Mr. Roy C. Hackley at the time he made application for patent thereon. The drawing and specification as originally filed by Mr. Hackley in 1924 are in evidence as Plaintiff's Exhibit 12 (Exhibit Book, p. 32). Mr. Hackley, the designer of the respondents' machines, reviewed this original specification and its accompanying drawing when he took the stand in this case and testified that they properly describe and illustrate the machine which was used by the respondents at the Skagit River Project (R., pp. 72 and 73).

Mr. Hackley, in his said original patent specification, and in referring to the drawing accompanying it, says:

> "It consists of an elongated container which is substantially egg-shaped in cross-section, as shown

in Fig. 4. The container is provided with a filling opening through which each batch of concrete is delivered, and the opening is in turn provided with a closure, such as generally indicated at 30, **which is securely fastened when air under pressure is delivered to the interior of the container.** The forward end of the container is provided with a cone-shaped nozzle, as shown at 31, and this in turn flanged as indicated at 32, to permit the steel discharge-pipe to be connected thereto. **A smooth, continuous, uninterrupted passage is thus formed between the interior of the container and the discharge-pipe, and choking or blocking of the nozzle is thus prevented.**

"One of the air-pipes leads to the nozzle of the container, while the remaining pipes, indicated at 34, 35 and 36, terminate at intermediate points. They extend through the rear head and are extended to advanced position, the pipe 34 terminating **directly in the nozzle,**[1] the pipe 35 at a point approximately one-half of the length of the container, and so on. **The air discharging from the pipe 34 insures a pressure in the discharge-pipe, and it also applies air to the concrete at or near the point where it escapes from the main container.** This causes the mass of concrete to discharge with considerable velocity and to travel in the general direction of the discharge pipe. It furthermore insures agitation and mixing of the sand, cement and rock, and as such produces a uniform coating of the rock in the mixture. The air furthermore mixes with the concrete and as such prevents it from discharging as a solid mass. In fact, the concrete delivered to the container is advanced forwardly by the pressure exerted by the air discharging from the pipes indicated at 35 and 36, **but as the pipe 34 is disposed directly in the nozzle, the mass is broken up into portions which are driven ahead under high velocity by the jet of air discharging from the pipe 34,** this being of considerable importance, as it positively prevents choking or blocking up of the apparatus." (Exhibit Book, p. 44.) (Emphasis ours.)

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[1] "Nozzle" as here used means the tapering portion of the receptacle.

When Mr. Hackley filed his original patent application, he swore that the foregoing was a clear, concise and exact description of his invention, viz., the apparatus which was used by the respondents at the Skagit River tunnel. It was just that. Moreover, it is an excellent description of a machine embodying the invention of the McMichael patent in suit. Hackley's specification and drawing not only show it to be an embodiment of the McMichael invention, so far as its structural characteristics are concerned, but also points out that the device operates in accordance with the plan or principle which McMichael and the plaintiff have always attributed to the apparatus of the patent in suit.

This Hackley patent application was filed on March 26, 1924. His machine had been in use at the Skagit River Project at least five or six months before this application was filed. (Oxenham saw the Hackley machine in operation on October 13, 1923, R., p. 78.) Therefore, Hackley was describing his machine *on the basis of experience* when he filed his patent application.

After the filing of this suit in April, 1924, Hackley's attorneys (representing respondents herein) rewrote the Hackley specification in a belated attempt to make it appear that the Hackley device operates differently from that of McMichael, notwithstanding that the devices of Hackley and McMichael comprise the same elements, arranged in the same way, and therefore *must* operate in the same manner. The original Hackley specification was written at a time when Hackley and his attorneys had no motive for misstating the operation of the machine. The specification was changed to the form in which it appears in the Hackley patent (Exhibit Book, p. 78) after this suit had been brought and at a time when Hackley and his counsel were more concerned with meeting what they conceived to be the exigencies of this case

than they were in having the Hackley patent properly describe the machine which it illustrates.

The Claims in Suit Accurately Describe Respondents' Devices.

Each and every of the claims in suit is for an apparatus, and each of these claims (1, 2, 17, 18, 24, 29, 34 and 35) reads upon and accurately describes each of the machines which respondents used at the Skagit River tunnel, *i. e.*, the device shown in the drawing, Plaintiff's Exhibit 13 (Exhibit Book, p. 84), and the later and slightly modified machine shown in the Hackley patent application drawing (Exhibit Book, p. 83).

Applying claim 1, for example, to the drawing, Exhibit 13, we have the following:

> "**In combination, a chamber for containing concrete forming materials** (the respondents' device, of course, has such a chamber), **a conduit leading therefrom** (the respondents' device has the conduit), **and having its walls joining the chamber walls with substantial smoothness** (the respondents' conduit obviously does join the chamber walls in this fashion), **and two compressed air inlet pipes connected to the chamber** (the velocity nozzle located directly in the tapering exit end of respondents' container is the terminal of one of these pipes; the other pipe may be any one of the other pipes entering the chamber,—for instance the pipe which enters the lower part of the rear end of the chamber), **one of them terminating in a nozzle** (the velocity nozzle) **inside the chamber** (like in McMichael's patent, respondents' said nozzle is located inside the tapering part of the chamber) **directed toward the opening into the said conduit and the other pipe opening into the chamber at a point remote from said nozzle.**" (The aforesaid pipe which enters the lower end of the rear wall of respondents' chamber is certainly "remote" from the velocity nozzle.)

Each of the other claims in suit is just as aptly and accurately descriptive of the respondents' machines as is claim 1 above quoted.

There is no escape from the conclusion that each of the respondents machines infringes the claims in suit, if your Honors find that the claims in suit are valid.

THE PRIOR ART.

Petitioner's Position Is Strengthened—Not Weakened—by the Very Number of Patents and Publications Relied Upon by the Respondents.

At the trial respondents placed in evidence literally hundreds of pages of printed matter in the form of patents and excerpts from periodicals. Only a portion of these are included in the enormous Exhibit Book in this case. The answer and amended answer plead 166 prior patents and 80 printed publications in alleged anticipation of McMichael.

It is obvious that if counsel for respondents had a single good reference, or even a fair reference, he would have been content to rely upon it, and would not have loaded the record with the appalling number of prior patents and publications which it now contains.

Respondents' counsel in offering dozens of patents and dozens of publications and scores of pages of depositions concerning alleged uses of sulphur mining apparatus, dredgers, grout and paint shooters, etc., is simply trying to "make omelettes of bad eggs," to use the words of his Honor Judge Hough in *Ball & Roller Bearing Co.* v. *Sanford Mfg. Co.*, 297 Fed. 163, 167, wherein it was said:

> "The voluminous record at bar is the best (or worst) example recently presented to us of useless

and misleading references to earlier patents and publications. It seems necessary to apply to patent litigation from time to time the maxim that one cannot make omelettes of bad eggs--no matter how many are used. One good reference is better than fifty poor ones, and the fifty do not make the one any better."

The Publications.

The many publications, in the form of excerpts from domestic and foreign periodicals, proceedings of technical societies, etc., offered in evidence by the respondents, add nothing to what is shown by the many patents upon which the respondents also rely. For the most part the publications have only to do with uses, here or there, of apparatus such as is shown in one or more of the patents. We shall, therefore, refrain from analyzing the publications. The patents actually disclose all and more than can possibly be gleaned from the publications, no matter how carefully the latter may be studied.

The Prior Patents.

At an earlier point in this brief, we stated that the pneumatic conveyors which preceded McMichael, and which were unsuitable for his purpose, belong to *two* generic classes. Firstly, there is that class of conveyor wherein the conveyed materials are carried along a conduit in *suspension* by the kinetic energy of an air stream, or, in other words, are carried as dust is blown in the wind. Secondly, there is that class of conveyors wherein air is applied to a liquid, or to a fluid mixture of liquid and entrained solids, to cause the liquid or fluid mixture to *flow* as water flows through a hose or pipe or as tooth paste emanates from the familiar collapsible container.

The twenty-five patents of the prior art which were offered in evidence by the respondents at the trial, fall into these two generic classes, as shown by the classification following this paragraph. In this classification conveyors of the type which transport materials through a conduit in suspension by the kinetic energy of an air stream appear under the heading "Kinetic Air Flotation." Those patents which disclose conveyors in which liquids, or fluid mixtures of liquids and entrained solids, are caused to *flow*, appear under the generic heading "Liquid Flow." There are twenty patents in this last mentioned group which, for convenience, we have divided into three sub-groups, *i. e.*, the patents showing devices which handle *cementitious materials* constitute one sub-group, the patents which show *lift pumps* constitute a second sub-group, and the patents which show devices which cause the flow of a *fluid mixture of liquid and entrained and suspended solids (other than cementitious materials)* constitute a third sub-group.

Classification of Prior Art Patents.

Kinetic Air Flotation.

Goldie, 707,840—dry cement (p. 514).[1]

Sickels, 99,360—sand and earth from caissons (p. 614).

Warren, 671,303—sand blast (p. 650).

Butler, 660,946—sand for locomotive sand boxes (p. 654).

Kolsche German, 18,394—sand, granules and coal-slack (p. 658).

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1 The pages given are those of the Exhibit Book.

Liquid Flow.

Cementitious Materials.

Smith, 122,498—so-called "Liquid" concrete of a consistency which will flow through valves and "settle to a perfectly level surface" (p. 484).

Goldie, 676,128—grout (p. 498).
Goldie, 676,129—grout (p. 506).
Moir, 778,878—lime grout (p. 520).
Canniff, 873,345—grout (p. 544).
McIlvrid, 958,421—grout (p. 560).

Lift Pumps.

Pohle, 487,639—water (p. 566).
Saunders, 597,023—water (p. 572).
Frasch, 799,642—liquid sulphur (p. 582).
Frasch, 800,127—liquid sulphur (p. 590).
Frizell, 233,499—water (p. 636).
Harris, 759,100—deep well fluids (water-oil) (p. 640).
Harris, 814,601—water (p. 644).

Entrained and Suspended Solids.

Duckham British, 4400/75—mud or spoil from dredges (p. 598).

Duckham British, 15,348/85—mud or spoil from dredges (p. 606).

Hussey, 497,427—water and mud from dredges, "gravel, mud, debris and other materials" (p. 662).

Hussey, 526,530—water and mud from dredges, "ground, gravel and other debris in water" (p. 670).

Rix & Donahoo, 635,270—water and spoil from dredges (p. 618).

Church, 487,606—alabastine paint "atomization by air spray nozzle" (p. 624).

Discussion of "Kinetic Air Flotation" Patents.

Of the five patents in this group, two of them, namely, Goldie 707,840 and the Warren patent, were urged upon his Honor Judge Hand in *both* of the prior suits involving the McMichael patent, and the Kolsche German patent was pleaded but not put in evidence. (See records in Ulen and Powers-Kennedy cases, Plaintiff's Physical Exhibits 4 and 11.)

The Sickels and Butler patents do not differ essentially from the others of this generic class of kinetic devices.

In all of these devices the material to be conveyed, whether it be dry cement, as in the Goldie patent, sand from a sand blast machine, as in the Warren patent, slack, sandy or granular material, as in Kolsche, is *carried along in suspension due to the kinetic energy of a moving current of air.* The material conveyed is swept along as dust is carried by the wind in a storm. In a device of this kind the lighter particles of the conveyed material are, of course, carried ahead of the heavier particles. All of these patents disclose devices which operate in accordance with a principle—kinetic air flotation—which renders them totally unsuitable for use in the transportation of concrete. Incidentally, if either McMichael or respondents used kinetic conveyors (which, of course, they do not) the volume of air consumed would be colossal,—the expenditure for compressing and supplying that air would be prohibitive. It would take an enormous volume of air traveling at fearful velocity to carry as heavy a material as concrete in suspension.

The *Goldie patent* No. 707,840 shows a *proposed* method of placing cement under railroad ties by first raising each tie and then blowing dry cement—an almost impalpable powder—along with moisture, under the tie. There is no

pressure back of or behind the material and no material to be acted on as a mass. The dry cement passes out of the vessel by gravity alone, and the material is conveyed and delivered in a completely disintegrated state. The apparatus is not adapted to be used and could not be used to handle *any* material in the manner provided by the patent in suit, and is not adapted nor intended to be used with *concrete* for *any* purpose.

The *Sickels patent* No. 99,360 shows a scheme for lifting excavated materials out of a caisson by a current of air blowing into the lower end of a pipe which projects into a caisson chamber in which a workman digs. When the comparatively gentle blast which blows through the pipe due to the working pressure of the caisson is not sufficient to pick up the materials, the *velocity* of air through the pipe may be increased by opening a valve *g*. The Sickels arrangement obviously taught nothing to McMichael or any one interested in transporting concrete without separating its aggregates.

The *Warren patent* No. 671,303 shows a sand blast machine of the conventional type, wherein sand flows down into a rapidly moving air stream and is carried along in suspension due to the velocity of the air.

The *Butler patent* No. 660,946 shows a pumping apparatus for water or sand. The patent shows two devices, one for water and the other for sand. This patent discloses nothing more than a small pipe adapted to be projected more or less into a sand or water receptacle, and which is provided with an air injector tube to establish a vacuum at the intake end of the pipe and establish a draft in the pipe to cause the transmission of the water or sand to be conveyed. When handling sand, the Butler device is a kinetic conveyor. When used with water, it has the characteristics of an ordinary water lift.

The *Kolsche German patent* No. 18,394 shows a typical velocity conveyor of the kind commonly used for transporting sand, grain and other granular materials which feasibly can be blown along in a pipe as dust is carried in the wind. In the Kolsche device the materials to be conveyed drop down into a current of rapidly moving air and are swept along in suspension by that current to the place of deposit. This is an excellent example of a kinetic conveyor,—totally unsuitable for the conveyance of concrete. It is one of the patents said by Judge Bourquin to be anticipatory of McMichael. (The Ninth Circuit Court of Appeals did not mention it.) We have therefore considered this patent in more detail, at a later point in the brief, under the heading "The Kolsche German Patent."

Discussion of "Liquid Flow" Patents.

The patents of this generic group differ considerably as to details of construction, but they all have one thing in common which distinguishes them from the concrete conveyor of the McMichael patent and renders them totally unsuitable for the conveyance of concrete—they all contemplate carrying the conveyed material as a fluid, *i. e.*, as a liquid or as a fluid mixture of a liquid and entrained solids.

Counsel for respondents has gone beyond all reason in the citation of prior art patents, and as is to be expected has cited a number of patents in this class of "Liquid Flow" which counsel in the Second Circuit cases wisely did not see fit to cite. It is interesting to note that many of the representative patents of this group upon which counsel relies in this case were presented in the Eastern cases, *i. e.*, the Smith patent 122,498, the Goldie patent 676,128, the Canniff patent 873,345, the

McIlvrid patent 958,421, and the Church patent 487,606 (see records in Ulen and Powers-Kennedy cases, Plaintiff's Physical Exhibits Nos. 4 and 11). It is also interesting to note that during the prosecution of the McMichael application the Patent Office considered the Pohle water-lift patent No. 347,196, which is representative of all of the patents in the sub-class of "Lift Pumps" upon which counsel for respondents relies in this case (see action of Jan. 24, 1907, McMichael file-wrapper, Exhibit Book, p. 205).

Liquid Flow—Cementitious Materials.

Of the six patents in this sub-group only two (Goldie 676,129 and Moir 778,878) were not presented in the New York cases.

All of the six patents in this sub-group are intended to handle liquids which do contain cementitious materials, but are *fluids* nevertheless. All of the patents in this sub-group, except the Smith patent, have to do with handling grout. *Grout* is simply a fluid mixture, sometimes a plastic fluid mixture, which can be easily forced through a pipe, even a very small pipe, by pressure exerted upon the fluid mixture, in a container from which it is to be ejected. The Smith patent is intended to handle a so-called "liquid concrete" of a consistency such that it will flow through valves and "settle to a perfectly level surface." None of the parties whose patents are included in this sub-group was concerned with the transmission of a material having the physical characteristics of ordinary concrete. More important, none of these patents discloses any arrangement of parts which will act upon a conveyed material as does the structure of the McMichael patent. No one of the patents in this sub-group discloses anything even remotely sug-

gestive of McMichael's velocity jet, which acts upon a mass of concrete *at the very point where it is compacted* at the ingress end of the conveyor conduit.

The *Smith patent* No. 122,498 is one which the Ninth Circuit Court of Appeals regards as anticipatory of McMichael, notwithstanding that this patent was considered and found not anticipating by the Second Circuit Court of Appeals in the Powers-Kennedy case (see Powers-Kennedy R., Plaintiff's Physical Exhibit 11). Therefore, we have given it special consideration under the heading "The Smith Patent of 1872."

The *Goldie patent* No. 676,128. Goldie says in his patent (p. 3, line 43) that it is his intention "to form a plastic body of cement of grout sufficiently fluid to flow from the basin into the feed pipe 14." The ingredients to form a fluid grout are placed in an ordinary funnel which is provided at its lower end with a stop cock. After the materials have flowed down out of the funnel, in the delivery pipe, the stop cock is shut off and air is pumped into the delivery pipe with a hand pump to cause the grout to flow under railroad ties. This patent simply fails to disclose any of the essential features of the McMichael invention.

The *Goldie patent* No. 676,129 shows an apparatus which is identical with the apparatus shown in the other Goldie patent 676,128. It is not believed that Goldie intended the disclosures of these patents to be different in any respect. One covers a *method* of injecting grout under railway ties, and the other covers the *apparatus* employed in carrying out that method.

The *Moir patent* No. 778,878 discloses a structure wherein a piston operating in a cylinder acts directly upon a fluid mixture of "lime grout, lime cement or other viscous fluids" to cause them to flow through a pipe,—exactly as tooth paste flows out of its container, or as

grease flows out of a grease gun. The Moir structure lacks all of the essentials of the McMichael combination. It has absolutely nothing in the way of a velocity jet acting upon a compacted mass of materials at a particular place for a definite purpose. If the Moir patent is of any significance in this case, it is only because it shows that the handling of fluid grout is an entirely different proposition than the handling of concrete. Grout is a true fluid and can be squeezed out of a compressor of the piston type just like grease or any other material which will flow.

The *Canniff patent* No. 873,345 shows another device for handling fluid grout. Canniff developed a device which was a very successful *grout* mixer and conveyor and which is being used by the Ransome Company and others to the present day. It is generally recognized as an excellent grouting machine. But Canniff never contemplated that it should be used for handling concrete. It is not adapted for handling concrete, and has never been practically used for that purpose. The mode of operation of the Canniff machine is essentially different from that of the McMichael apparatus. Canniff first injects air into the fluid mixture of grout to mix it. After this mixing has been accomplished, he causes the fluid mixture to flow out of the apparatus by a pressure of air exerted upon the mass. Being a true fluid, the grout will flow perfectly out of an apparatus of this kind. Respondents put in some testimony to show that they did cause something which might be called "concrete" to flow out of something which they *called* the Canniff apparatus. The alleged Canniff device which respondents employed was, however, a *reconstructed* Canniff device. It is of unknown origin,—possibly constructed within recent years. Even if it did eject concrete after a fashion that is a matter of no consequence in this case, because the

Canniff apparatus, even in the reconstructed form in which respondents attempted to use it for concrete, cannot and does not operate as does the McMichael apparatus. It does not comprise the peculiar arrangement of elements which co-operate to make possible McMichael's characteristic mode of operation.

The *McIlvrid patent* No. 958,421 shows another machine for causing a fluid grout mixture to flow by pressure exerted upon the surface of the fluid mass within a chamber with which a hose is connected. Aside from certain features of construction, which are of absolutely no interest in this case, the grouter of the McIlvrid patent does not differ in any material respect from the devices of the Moir and Canniff patents, *supra*.

Liquid Flow—Lift Pumps.

It is probably because counsel for respondents has injected this group of *lift pump* patents into this record, that he contends the prior art presented in the case at bar is *different* from the prior art presented in the Second Circuit cases. As we view the matter, counsel for the defendants in the Eastern cases are to be complimented, rather than censured, for not having imposed upon the courts the consideration of patents so far afield from conveyance of concrete as are these patents showing *lift pumps*.

These patents are all concerned with getting some liquid, *i. e.*, water, oil, or liquid sulphur, out of a hole in the ground by injecting air into a pipe containing a column of the liquid to lighten the column and permit it to rise. Quite obviously, no one of these patents discloses anything which was ever used for the transportation of concrete, or which could be used for such purpose. Counsel for respondents seem to believe that these

lift pump patents have some degree of pertinency to the case at bar, because in the operation of these lift pumps the lifted fluid usually comes out of the upper end of the pipe in gulps, that is to say, first a certain quantity of water, then a quantity of the air which was used to lighten the column, then another quantity of water, etc. We freely admit that lift pumps do operate in this way. They have been known from time immemorial. The lift pump art is much older than any of the patents cited by respondents. It seems entirely sufficient to say that no one of these lift pump patents discloses McMichael's structure, that no one of them could be used for conveying concrete, that no one of them was ever used for conveying concrete. The structures of these lift pump patents are as different from the McMichael structure as anything that can be imagined. No one, not even the respondents in their extremity, has ever attempted to use the lift pump theory in transporting concrete. The operation of a lift pump depends solely and simply upon *lightening* a column of *liquid* by injecting air into it. Concrete is simply incapable of being transported or lifted by any such treatment.

The *Pohle patent* No. 487,639 discloses a water lift of the most simple type. A column of water is lightened by injecting air into it. The lightened column naturally rises due to the hydrostatic head of the liquid surrounding the pipe into which the air is injected.

The *Saunders patent* No. 597,023 discloses another lift pump wherein a column of water is lightened and caused to rise out of a well by injecting air into it.

The *Frasch patents* Nos. 799,642 and 800,127 show nothing more than the utilization of the water lift idea in the elevation of *liquid sulphur*. The liquid sulphur devices of the Frasch patents operate upon precisely the

same principle as do the earlier water lifts of Pohle and Saunders. Much testimony was taken to show that liquid lifts of the type shown in these Frasch patents were used in sulphur mining. Surely they were used for mining liquid sulphur, but no one, not even the respondents, contends that these devices could be used for transporting concrete. Moreover, these devices are totally incapable of being *reconstructed* to handle concrete. They involve a principle of operation which is not applicable to the transportation of concrete.

The *Frizell patent* No. 233,499 shows another water lift, and deserves no special comment. This inventor tried to get away from having his water gulp out of the top of his pipe, and accomplished this objective by lightening his column of water by air admitted "in the form of minute bubbles."

The *Harris patents* Nos. 759,100 and 814,601 are also concerned simply with lifting a liquid out of a well by lightening a column of the liquid by the admission of air to the column. Harris was concerned primarily with the elevation of oil out of oil wells.

Liquid Flow—Entrained and Suspended Solids.

The six patents of this sub-group are all concerned with handling fluids which have solids, such as mud, sand, rocks, etc., entrained in the water which is the *carrying medium*. All of these devices work upon the theory that water can be *pumped*, whether it be clean or dirty, and that the presence of entrained solids (even very large solids in large pumps) will not prevent the water from being pumped. For the most part the patents of this sub-group relate to pumping and dredging operations where water containing mud or "spoil," sand and gravel is merely pumped in one of the oldest ways known to

mankind, that is to say, by causing the water and its entrained solids to flow into a closed chamber and then exerting pressure upon the water to flow it out of the chamber. Devices of this kind operate in accordance with a principle which is of no avail in the transportation of concrete, namely, that a pump will handle solids if accompanied by sufficient water. Neither McMichael nor respondents *pump* concrete. It is obvious that if sufficient water were added to concrete to permit it to be *pumped,* it would be unusable for any practical purpose. Before a mixture of water and entrained solids can be pumped, the water must be the predominating ingredient of the mixture. Water is not and should not be the predominating ingredient in concrete. Even the wettest of "wet concrete" does not comprise anything like the proportion of water which is necessary before mud or spoil from dredges can be *pumped.*

The *Duckham British patents* Nos. 4400 of 1875, and 15,348 of 1885, show mud pumps, *i. e.,* devices which are adapted to discharge water and entrained mud from a barge by air pressure applied to the fluid mixture of water and mud. The patents lack all of the essentials of the McMichael apparatus, operate differently than does the McMichael apparatus, and could not be utilized for the conveyance of concrete. However, counsel for respondents and the courts below in this case lay particular stress on these patents—because they speak of (*but do not illustrate*) the use of air and water *nozzles as agitators,* or, as Duckham says, so that "the particles are prevented from settling and are *kept in suspension* until the whole is expelled from the tank." These Duckham patents certainly fall far short of being "anticipations" of the McMichael invention, but since the Ninth Circuit Court of Appeals regards them as important, we have discussed them quite fully under the later heading,

"The Duckham British Patents Nos. 4400 of 1875 and 15,348 of 1885."

The *Hussey patents* Nos. 497,427 and 526,530 show so-called "vacuum dredges," which, by condensation of steam, suck water and entrained solids into a chamber, and then, after the closing of the intake port of the chamber and the opening of a discharge port, cause the water and its entrained solids to flow out of the chamber by applying steam to create a discharging pressure.

These Hussey dredgers were probably very satisfactory devices for the purpose for which they were intended. Respondents' counsel has taken depositions to show that they were successful dredging devices. The important consideration, however, is that the Hussey vacuum dredger lacks all of the essential features of the McMichael structure, and operates in accordance with an entirely different plan. The McMichael apparatus is certainly something entirely different from a device which sucks water and entrained spoil into a tank and then merely ejects it by applied pressure. Being a different kind of device, the McMichael apparatus embodies different means,—a different combination of elements—a combination of elements which Hussey does not disclose.

The *Rix & Donahoo patent* No. 635,270 shows another type of dredger which conveys mud and "spoil" by flotation in water. The apparatus of this patent has no relation to the McMichael apparatus and operates according to an entirely different plan. It would be totally unsuitable for the conveyance of concrete.

The *Church patent* No. 487,606 shows a device for spraying alabastine paint. The defendants in the New York cases, like respondents in this case, cited it, but for what reason we are unable to perceive. It is as remote from the McMichael invention as anything that can be imagined.

The Smith Patent of 1872.

(Exhibit Book, p. 484.)

In speaking of this patent the Ninth Circuit Court of Appeals in its opinion said:

> "The device contained all of the features of appellants' (petitioners') patent **except the nozzle for admission of air near the point of exit.**" (R., p. 669.)

Since the device of the Smith patent admittedly lacks that essential element—the velocity nozzle—it is immaterial whether or not the Smith device will work. If it will work, it works differently from the McMichael machine and differently from respondents' machines, because both the McMichael machine and respondents' machines depend for their effectiveness upon a velocity nozzle located just where the concrete passes from the container into the conduit.

We believe that your Honors, bearing in mind that the velocity nozzle is a distinguishing element of all of the McMichael claims in suit, will agree with the Second Circuit Court of Appeals when, in the Powers-Kennedy case, it says of the Smith patent: **"It cannot be regarded as an anticipation."**

In comparing Smith's device with the McMichael apparatus, counsel for respondents has said:

> "Smith operated on the *same object or material*, for the same purpose and with the *same means.*"

Let us see whether or not Smith did act on the *same material* as McMichael, and also whether or not Smith did utilize the *same means.*

Smith was not handling the same material as McMichael. This clearly appears in the specification of the Smith patent. The material which Smith handled, although called liquid "concrete" was in fact a

very thin watery mixture which would flow through a tortuous passage *d* from the mixing hopper C to the air chamber F. Over and over again in his specification, Smith emphasizes the fact that the composition must be thin enough to flow with great facility. In the fourth paragraph of his specification, he says that his device is to handle a composition "the properties of which are adapted to be conveyed and laid while in a *fluid state.*" In referring to how the liquid composition gets from the mixing hopper C through the tortuous passage *d*, Smith says: "I then open the valves and let it *flow off* through the pipe D." He also says that the composition is "*sufficiently liquid* to settle to a *perfectly level surface.*"

It is clear that concrete to be used in tunnel linings, etc., or for any other useful purpose, as conveyed by the McMichael apparatus, is not the same as the soupy fluid which was the only thing which the Smith apparatus could handle. Concrete such as is used in tunnels (such as is used by respondents) could not possibly flow through the tortuous passage *d* of the Smith apparatus. Moreover, concrete such as handled by McMichael, and such as is placed by the respondents[1] is certainly not "sufficiently liquid to settle to a perfectly level surface" as specified by Smith.

The particularity with which Smith specified that the composition handled by his machine must be a "*liquid* composition" emphasizes the dissimilarity between the

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1 The concrete used by respondents is described by the witness Oxenham (R., p. 530) as follows:

"Q. When you observed the operation of the pneumatic placing apparatus in the Skagit River Tunnel and the operations there of the Hackley machine, did you observe whether the concrete forming materials were of a consistency such as that they stood in a pile with sloping sides or whether those materials would, of their own flow assume a level condition?

"A. Stood in a pile."

Smith structure and that of McMichael. The McMichael apparatus is not limited to the use of such a useless "liquid composition." If it were so limited, it would be an unused device, just as the Smith device is unused. It is not even limited to a "wet" composition (Pat., p. 3, lines 49-59). The Smith patent shows on its face that Smith did not know how to handle ordinary concrete like that handled by the McMichael machines, that is concrete such as is used in tunnels and in building operations, which has an inherent tendency to bridge and arch and to block and jam any passage through which an attempt may be made to cause it to flow. Not knowing how to handle the kind of concrete which everyone wants to use, Smith was obliged to confine himself to *liquid concrete*,—something which no one wants to use, or would be permitted to use. Therefore, the Smith patent passed into the oblivion from which it first emerged to meet the exigencies of the defendant in the Powers-Kennedy case.

But even if it were admitted that Smith did contemplate handling concrete like that handled by McMichael, the fact would nevertheless remain that the *means employed by Smith is different from that of McMichael.* If there is any one salient fact which is emphasized in the McMichael patent or which has been demonstrated by the testimony and arguments in this case, it is that McMichael's velocity jet, *acting upon a compacted mass of concrete at a definite point for a particular purpose,* is an absolutely essential element of the McMichael combination. This element, as well as the sloping walls of the container, which co-operate with the velocity jet to give McMichael's apparatus its characteristic mode of operation, are lacking in the Smith disclosure. Smith did not get McMichael's results. The Smith device is and always has been a failure. It was never heard of in the forty-three years between its grant and the grant of the

McMichael patent. This is so because Smith does not disclose the *means* of McMichael.

Because Smith did not disclose the *means* of the McMichael patent, he was obliged to limit himself to "*liquid* concrete." If respondents want to use the Smith apparatus, we shall not quarrel with them. But the respondents do not want to use the Smith apparatus. The respondents use McMichael's essential combination in order that they may get McMichael's results,—in order that they may successfully transport concrete of a character which Smith could not handle.

The language of Judge Coxe in *Cimiotti Unhairing Co. v. American Company,* 115 Fed. Rep. 498, 500, is applicable to the Smith patent. Judge Coxe said:

> "It emerged from oblivion solely to meet the exigencies of this litigation."

The Duckham British Patents Nos. 4400 of 1875 and 15,348 of 1885.

(Exhibit Book, pp. 598 and 606.)

The Duckham patents mention but *do not illustrate* certain nozzles for stirring up mud in a tank.

The Ninth Circuit Court of Appeals in its opinion quotes from the Duckham 1875 patent as follows:

> "I prefer to inject compressed air . . . through a number of nozzles **at the bottom of the tank, said nozzles being pointed toward the outlet.** By this means the particles are prohibited from settling and are kept in suspension until the whole is expelled from the tank. Compressed air may, moreover, be admitted **into the discharge pipe** with the same object." (R., p. 669.)

Then the court reaches a conclusion as follows:

> "We think it indisputable that Duckham in prescribing the use of pipes for the admission of com-

> pressed air in the tank, the same distributed along the bottom of the tank, and **one of them locatable at the exit**, presented the use of all that is included in the appellant's combination, save and except the U-bend. . . ."

We respectfully submit that the matter quoted from the Duckham 1875 patent does not justify the conclusion that Duckham contemplated a "*nozzle locatable at the exit.*" Obviously, Duckham could have had many pipes "at the bottom" and "*pointing* toward the exit" which would not in any sense act upon the material (mud and water) at the place where the material passes from the container into the conduit.

Furthermore, the statement quoted from Duckham that air might "be admitted into the discharge pipe" can, and we think certainly does, mean something entirely different than placing a nozzle as did McMichael *at the very place* where the material passes from the container into the conduit. The mere placing of a nozzle in a conduit is insufficient to meet the requirements of a concrete placing machine. As taught by McMichael, and as demonstrated by the commercial practice of petitioner, the respondents in this case, and the defendants in the New York cases, the nozzle must be at the *very place* where the container merges into the conduit.

There is, therefore, in the Duckham 1875 patent no justification for the conclusion of the Ninth Circuit Court of Appeals that Duckham prescribed the use of nozzles "*locatable at the exit.*"

Moreover, the Duckham 1875 patent contains an additional statement which is entirely out of harmony with the conclusion that Duckham might have had a nozzle at the place where his material passed from the container into the pipe. Duckham says:

> "To prevent the choking of the pipes a *screen or grating* is provided through which the mud or spoil

passes before it enters the outlet pipe." (Provisional Spec., p. 2; Complete Spec., p. 4.)

Therefore, the thing which Duckham had at the point where the material passed from the container into the conduit was a screen or grating. The *unillustrated* nozzles were undoubtedly located away from the screen or grating and "along the bottom" or even perhaps in the discharge pipe at points away from this screen or grating.

Even if the Ninth Circuit Court of Appeals entertained a doubt as to what Duckham *intended,* that doubt, under authorities too numerous to mention, should have been resolved against Duckham and not against the McMichael patent.

Particularly should any doubt be resolved against Duckham when it is considered that the Duckham apparatus, even if it were provided with an air or water nozzle placed at the junction of chamber and conduit, would require *other radical changes* before it would be available for handling concrete. For instance, the Duckham conduit does not join the chamber walls with that "substantial smoothness" which is recited in some of McMichael's claims and which is so very necessary in a concrete placer. Moreover, to handle concrete, Duckham would necessarily have to use entirely different pressure than the fifteen pounds per square inch which he used in handling mud and spoil. Pressures of approximately one hundred pounds per square inch are required in a concrete placer. These are but two of the reasons why the Duckam apparatus would require radical modification, in addition to providing it with a nozzle at the beginning of the conduit, if an attempt were made to use the Duckham apparatus for placing concrete.

The Duckham idea consisted in providing a barge with enormous cylindrical tanks for the storage of water and

entrained mud which was to be transported by the barges from a point where it was taken off of the sea bottom. Duckham discharged the water and its entrained mud by *flowing it* through pipes. The fluid mixture of water and mud flowed so readily that it could be ejected by a pressure as low as *fifteen pounds* per square inch (see the publication Defendants' Exhibit 29, Exhibit Book, p. 188).

Obviously, when mud and water are stored in an enormous tank such as was used by Duckham, some of the mud will settle to the bottom of the tank and must be stirred up if it is going to flow off with the water. Duckham in his patents *suggested* two ways of stirring up the mud so that it would flow off with the water. *He did not illustrate either way in his drawings.* One way which was suggested was to use mechanical agitators. The alternative scheme for stirring up the mud was to use air and water nozzles.

The Ninth Circuit Court of Appeals refers to the minutes of the proceedings of the Institution of Civil Engineers for 1887 (Exhibit Book, pp. 187-188) and quotes therefrom, as the language of Duckham, an excerpt from an article which apparently was not written by Duckham but which article, in referring to a Duckham device of some kind (whether or not it was the device of the Duckham patents does not appear), said:

> "with clay or stiff mud, if the nozzles of the air-injection pipes were too small, the compressed air instead of driving out the material simply pierced holes through it, escaping through the discharge pipe and carrying along with it all the liquid and thin material in the tanks. This defect was easily rectified by rearranging and increasing the size of the injection nozzles, and the apparatus now gives most satisfactory results." (R., p. 670.)

The fact that the nozzles of Duckham performed their

mud agitating function better after some "rearranging" certainly does not justify the assumption that Duckham's nozzles were "rearranged" or ever arranged in a position corresponding to the position of the velocity nozzle of the McMichael concrete placer.

The Kolsche German Patent.[1]

(Exhibit Book, p. 183.)

Judge Bourquin, in referring to this old German patent No. 18,394 of 1881, said (R., pp. 619 and 620):

> "The third is Kolsche's German patent 18,394 of 1882 for 'apparatus for conveying substances slack, sandy or granular material, by means of a **current** of air.'
>
> "The apparatus is like McMichael's without the U bend. That is, it is an upright cylindrical container with hopper bottom terminating in a discharge pipe. Compressed air is applied above or behind the material in the container to force it down and into the discharge pipe, and at that point like air is admitted to assist in driving the material through the pipe.
>
> "**Without any change**, perhaps save adjustments to circumstances as always, **Kolsche's apparatus and method will transport concrete as does McMichael's.** Kolsche could rightfully devote it to that analogous use. It follows that McMichael's essentially unchanged application of Kolsche to analogous materials and uses, is not invention. In principle, essential design, function, operation, object and result, Kolsche and McMichael are one and the same. **Either reads on the other.**
>
> "Kolsche, if later and devoted to concrete, might infringe McMichael, and by the same token being earlier, he anticipates him." (Bold-face ours.)

Apparently Judge Bourquin arrived at the above con-

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1 This patent was not mentioned in the opinion of the Ninth Circuit Court of Appeals although one of the prior art patents stressed by respondents below.

clusions from mere inspection of the Kolsche drawing. Certainly if he had read the specification of the Kolsche patent he should have perceived that it illustrates and describes a *kinetic conveyor* which operates in a manner radically different from the operation of the concrete placers under consideration in this case. In the following quotation from a translation of the Kolsche patent (Exhibit Book, p. 183) the bold-face is ours:

"GERMAN PATENT No. 18394

"Ludwig Kolsche, Haardt, Westfalen,

"Protected from Oct. 16, 1881: Issued July 4, 1882: Class 35.

"APPARATUS FOR CONVEYING SUBSTANCES SLACK, SANDY OR GRANULAR MATERIAL BY MEANS OF A CURRENT OF AIR.

"The apparatus comprises the intake nozzle *a* and the air passage *d e*, through which a **continuous current** of air is driven **by means of a blower (fan)**. This **current** must be of such strength that the particles **dropping down through the opening** *c c* are engaged and **carried along** through the entire air passage *d e* and collect in a heap on discharging from the passage *e*."

It is clear from the Kolsche specification, even from a careful examination of the Kolsche drawing, that this patent describes a *kinetic conveyor, i. e.*, one in which the conveyed materials are carried along in suspension by the velocity of a *current of air.*

It is also clear that Kolsche does not disclose anything corresponding either in *construction, location* or *function* to McMichael's slug forming velocity nozzle.

Kolsche employes a blower or fan, not shown, which is located somewhere to the left of his machine (as shown in the patent drawing) and the *blower* sets up a *current* of air which picks up and carries along "particles" which "drop" down through the openings *c-c*.

If concrete were put in the Kolsche device, it would immediately arch and jam at the small openings *c-c*. More important, from the standpoint of this case, there is no slug forming nozzle in the Kolsche disclosure.

Judge Bourquin was clearly in error when he said:

> "Kolsche, if later and devoted to concrete *might* infringe McMichael"

because the Kolsche construction lacks, among other things, the salient feature of the McMichael claims. It has no nozzle or anything which could function as does the velocity nozzle of McMichael.

If respondents care to use the kinetic conveyor of Kolsche, or any other kinetic conveyor for that matter, they will become involved in no quarrel with this petitioner.

The Allegation of Prior Invention and Use by Thomas S. Leake.

In an attempt to show that the invention of the patent in suit had been known and publicly used in New Orleans prior to the filing of McMichael's patent application in January, 1907, the respondents, in 1927, took the deposition of Mr. Thomas S. Leake (R., pp. 578-609). The trial court did not see the witness. At the time he testified Mr. Leake was 67 years old and relied entirely upon his memory in testifying about things he was supposed to have done in 1905—22 years earlier. His testimony is full of inconsistent statements and repeated assertions of poor memory in regard to the events of 1905.

Counsel for respondents did not attempt to corroborate this deposition by the testimony of any other witness. The device alleged to have been used in 1905 was shown to have been almost immediately destroyed (R., p. 593). A pencil sketch made by Leake is in evidence as "Defend-

ants' Chicago Exhibit 127" (Exhibit Book, p. 694). *There is nothing in the record to show when this sketch was made.* (We happen to know, however, that it was made less than a year and a half ago while Leake was testifying in another case involving the McMichael patent.) The record does not contain a shred of contemporaneous documentary or physical evidence to support Leake's recollection of what happened in New Orleans in 1905.

Leake's Sketch Does Not Show a Velocity Nozzle and Leake Does Not Claim to Have Used Such a Nozzle in His 1905 Experiment.

All of the McMichael claims involved in this suit in one way or another recite the velocity nozzle as an element of the patented combination. This velocity nozzle, which acts upon the concrete at the point which it is compacted in passing from the chamber into the conduit, is an absolutely essential element of the pneumatic concrete placers with which this suit is concerned. Therefore, anything which Leake may have done in New Orleans in 1905 would seem to be entirely immaterial to the issues of this case, when it clearly appears that whatever he used certainly did not include the velocity nozzle.

The Leake sketch, Chicago Exhibit 127, shows no nozzle at the junction between the container and the conduit.

Furthermore, Leake's testimony very clearly indicates that the New Orleans experimental device of 1905 did not have anything corresponding to the velocity nozzle.

On direct examination Mr. Leake was asked various questions intended to draw forth a comparison between his 1905 experiment and a device which he, Leake, afterwards placed in the Webster Building in Chicago in 1907

or thereafter, *i. e.*, long after the filing of McMichael's application. This later device, at the Webster Building, did comprise something like the velocity nozzle which was new with McMichael. The New Orleans experiment did not. The testimony is as follows:

> "Q. That (the Webster Building machine made long after McMichael's filing date and having a velocity nozzle) was the same machine in theory, using new materials, but constructed in the same general design as the one you had used in New Orleans, was it not?
>
> "A. Oh, no; the New Orleans one **had nothing automatic.**
>
> "Q. But as far as applying the principle of controlling the mixture through the application of air and sending it to the higher point?
>
> "A. Oh, no. This (the later machine of the Webster Building) takes air on the bottom and top both." (R., p. 598.)

When Leake said the New Orleans experiment "had nothing automatic" he meant that it had no velocity nozzle. This is made clear by his next answer, which indicates that the New Orleans device was different from the later device of the Webster Building which "takes air on the bottom and top both."

Although Leake's testimony is vague throughout, the foregoing quotation from his deposition, together with the sketch, Defendants' Chicago Exhibit 127, makes it clear that the 1905 experiment in New Orleans was absolutely devoid of the most essential structural feature of the McMichael apparatus. Its lack of the velocity nozzle undoubtedly accounts for the fact that it was an abandoned failure.

The Documents Dated After McMichael's Filing Date Which the Ninth Circuit Court of Appeals Regards as Evidence that Leake Invented and Used the Invention of the Patent in Suit Before McMichael's Filing Date.

The Ninth Circuit Court of Appeals, being unable to find a particle of contemporaneous physical or documentary evidence corroborating Leake's testimony concerning the alleged prior use in 1905, quotes from a patent application of Leake, filed *after* McMichael's filing date as supposed corroboration of Leake's testimony concerning events said to have happened *before* McMichael's filing date, and the Circuit Court of Appeals for the Ninth Circuit regards a preliminary statement (affidavit) made by Leake in **1909** as acceptable corroboration of Leake's testimony concerning events said to have transpired in **1905**. The preliminary statement (R., p. 582) was filed in an interference between Leake and McMichael. The interference terminated favorably to McMichael, because petitioner, which eventually owned both applications, concluded that McMichael and not Leake was the inventor of the essential combination including the velocity nozzle. That the interference was properly terminated is demonstrated by the fact that Leake does not even claim to have conceived anything corresponding to the velocity nozzle before McMichael's filing date. Admittedly the 1905 experiment did not include it because the sketch which purports to illustrate the 1905 experiment is devoid of any such nozzle.

The only conceivable proper purpose to which the Leake preliminary statement could have been put in the present case would have been to impeach or discredit Leake as a witness. But as evidence to sustain the contention that Leake was a prior inventor, it is palpably in-

competent. Originating *after* McMichael's filing date, it cannot establish events *preceding* McMichael's filing date.

Furthermore, the Ninth Circuit Court of Appeals regards certain statements made in Leake's patent application in **1908**, by Leake's *attorney*, who did not even pretend to have first-hand knowledge of the facts, as competent evidence corroborating Leake's verbal testimony as to the alleged happenings in **1905**. The attorney was not called as a witness. These are simply laudatory statements[1] made by the attorney in behalf of his client. All of this argumentative laudation is consistent with the fact that Leake made the apparatus of his patent application *after McMichael's filing date*. The attorney did not say when Leake's use of his patent application machine was made. Yet the Ninth Circuit Court of Appeals regards the laudatory statements made in **1908**, after McMichael's filing date, as evidence that a device made in **1905** was practical and satisfactory.

There is no theory upon which the unsworn statements of Leake's patent attorney in an *ex parte* prosecution of a patent application can be considered competent evidence for or against either of the parties to this litigation.

In the Powers-Kennedy case the defendants attempted unsuccessfully to persuade the courts to give favorable consideration to the same kind of incompetent evidence which has been favorably considered by the Ninth Circuit Court of Appeals in this case. The Second Circuit Court of Appeals said:

> "The new defense of prior use was held by the district court not sufficiently proved; and with this we agree. This use was of a machine which Artingstall and Fanning said that they saw laying a con-

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1 These statements appear in the amendments, papers 5 and 9, of the Leake file-wrapper (Exhibit Book, pp. 367 and 378).

crete floor in 1903, subsequently changing the date to 1904. That was twenty-two years before they gave their testimony, and there was no documentary corroboration of any kind. *It is true that in 1918 Artinstall described very generally before a meeting of engineers that this process was practiced in 1903, but that can not be deemed documentary corroboration.*" (27 Fed. (2) 669.)

The Court of Appeals for the Ninth Circuit clearly erred when it accepted statements in Leake's 1909 preliminary statement, and laudatory statements made by Leake's attorney after McMichael's filing date, as corroborative of Leake's verbal testimony concerning the alleged experimental device of 1905.

This is the First Case in Which Any Federal Court of the United States Has Held that the Oral Testimony of an Alleged Prior Inventor or Prior User—Uncorroborated and Unsupported by Contemporaneous Writings, Drawings or Physical Exhibits—Is Sufficient to Invalidate an Issued Patent.

Such, however, was the decision of the Ninth Circuit Court of Appeals relative to the prior invention and use which the respondents claimed to have been made by Thomas S. Leake at New Orleans in 1905.

In support of the conclusion that the uncorroborated and unsupported deposition of Leake is sufficient to establish prior invention and use, the Ninth Circuit Court of Appeals cites the following cases:

Reed v. *Cutter*, 1 Story 590, 596.

C. F. Mueller Co. v. *A. Zeregas Sons*, 12 Fed. (2d) 517, 518.

Mayer v. *A. & H. G. Mutschler*, 248 Fed. 911, 914.

These cases do not support the proposition which they are cited to sustain.

Reed v. *Cutter*, 1 Story, 590, 596, in no way treats of the kind and degree of evidence required to establish prior invention or prior use. This case merely asserts the familiar rule that when a public use *has been* satisfactorily established, it makes no difference whether the use was known to a large number of people, or to only a few, or even to but one. But this well-known rule does not for a minute sustain the proposition that prior invention or use may be established, in the absence of any contemporary device or writing, by the *uncorroborated testimony of a single witness.*

C. F. Mueller Co. v. *A. Zeregas Sons*, 12 Fed. (2d) 517, 518. No patent was held invalid in this case bacause of any public use. The trial court had held three patents *valid*. The Court of Appeals found one of them, a design patent, invalid only because of lack of patentable subject-matter. The case involved a dispute between a patentee and a rival inventor, but the trial court resolved the dispute in favor of the patentee.

Mayer v. *A. & H. G. Mutschler*, 248 Fed. 911, 914. This case was cited by the Ninth Circuit Court of Appeals in support of the proposition that the testimony of one witness may be sufficient, but the cited case is readily distinguished from the case at bar by the following quotation from the opinion:

> "The rules as to prior use are severe and rightly so and Archbald is a witness hostile to plaintiff; *but the existence of the machine is not denied*, its date of erection *proved by other testimony than Archbald's*, as also is its unchanged condition, and still another witness swears that it was in 1911 as it is now."

Clearly the testimony of Leake in this case was not corroborated and supported as was the testimony of Archbald in the case cited.

Such are the cases cited by the Ninth Circuit Court of Appeals in support of the startling conclusion that the oral testimony of Leake, given 22 years after the fact, may be accepted without corroboration or contemporaneous evidence of any character to defeat what otherwise is a valid and valuable patent.

The Law as to Proof of Alleged Prior Public Use of a Patented Invention.

It is well settled that to invalidate an issued patent a prior use must be proved "by evidence so cogent as to leave no reasonable doubt."

Perhaps the leading authority is *Deering* v. *Winona Harvester Works,* 155 U. S. 286, in which the court said (p. 300):

> "As we have had occasion before to observe oral testimony, unsupported by patents or exhibits, tending to show prior use of a device regularly patented, is, in the nature of the case, open to grave suspicion. *The Barbed Wire Patent,* 143 U. S. 275. Granting the witnesses to be of the highest character, and never so conscientious in their desire to tell only the truth, the possibility of their being mistaken as to the exact device used, which, though bearing a general resemblance to the one patented, may differ from it in the very particular which makes it patentable, are such as to render oral testimony peculiarly untrustworthy; particularly so if the testimony be taken after the lapse of years from the time the alleged anticipating device was used. If there be added to this a personal bias, or an incentive to color the testimony, in the interest of the party calling the witness, to say nothing of downright perjury, its value is of course, still more seriously impaired. *This case is an apt illustration of the wisdom of the rule requiring such anticipations to be proven by evidence so cogent as to leave no reasonable doubt in the mind of the court,* that the transaction oc-

curred substantially as stated. The very exhibit produced by the witness Heller contradicted, so far as it could contradict, his testimony, and the witness who ought to have corroborated his story, gave a version which showed it to be untrue in more than one important particular."

This holding, as to the degree of proof required to establish a prior use, has been reiterated by the Supreme Court in recent cases. *Adamson* v. *Gilliland,* 242 U. S. 350, 1917; *T. H. Symington Co.* v. *National Malleable Castings Co.,* 250 U. S. 383, 1919, and *Eibel Process Co.* v. *Minnesota & Ontario Paper Co.,* 261 U. S. 45, 1923.

In the Eibel case, the latest pronouncement of the Supreme Court on the proof required to establish prior use, the court said (p. 60):

> "It is true that some witnesses testify that they realized before Eibel's application that speeding up the stock to equal velocity with the wire would solve the difficulty and aid the speed. But there is not a single written record, letter or specification of prior date to Eibel's application that discloses any such discovery by anyone, or the use of the pitch of the wire to aid the speed of the machine. *The oral evidence on this point falls far short of being enough to overcome the presumption of novelty from the granting of the patent.* The temptation to remember in such cases and the ease with which honest witnesses can convince themselves after many years of having had a conception at the basis of a valuable patent, are well known in this branch of law, and have properly led to a *rule that evidence to prove prior discovery must be clear and satisfactory.*"

T. H. Symington Company v. *National Malleable Castings Company et al.,* 250 U. S. 383, 386:

> "This court has pointed out that oral testimony tending to show prior invention as against existing letters patent is, in the absence of models, drawings, or kindred evidence, open to grave suspicion; par-

ticularly if the testimony be taken after the lapse of years from the time of the alleged invention. *Deering* v. *Winona Harvester Works*, 155 U. S. 286, 300."

The Most That Can Be Said for Leake's 1905 Device Is That It Was a Discarded and Abandoned Experiment.

The alleged 1905 experiment of Leake was unquestionably discarded and abandoned almost immediately after it was made.

Leake says:

"A. No; that was nothing but a crude machine put up there to see whether I could put concrete up in the air.

"Q. What happened after you used that?

"A. I tore it down.

"Q. Did you keep that?

"A. No. It was nothing only a lot of two by four stuff put up with hoops.

"Q. So that is not in existence now?

"A. Oh, no.

"Q. Do you know of any other pictures or blueprints of that device other than the one you have referred to here?[1]

"A. No." (R., p. 586.)

This is the Leake device which the Ninth Circuit Court of Appeals credits as a prior public use of McMichael's successful combination of elements.

In striking contrast, the Second Circuit Court of Appeals in the Powers-Kennedy case says:

"It is one thing to say that a continuous use to date may be found on oral testimony to have started at a given time, and quite another to say that such testimony is enough when it describes only a casual

[1] The "one you have referred to here" is the sketch made by Leake himself in connection with his testimony in 1927 (Exhibit Book, pp. 693, 694).

use, abandoned thereafter, and never entering into the art until after the patent in suit was applied for. . . . *Such casual and abandoned uses do not contribute to the stock of knowledge which makes up the art. If we may invalidate a patent upon such prior uses so proved, no patent would be safe.*" (27 Fed. (2) 670.)

The language of the Second Circuit Court of Appeals is particularly applicable to Leake's casual and abandoned experiment of 1905. Leake *after* McMichael's filing date did apply for a patent. Leake's patent application, however, was essentially different from his abandoned experiment of 1905. The patent application included McMichael's essential velocity nozzle. The abandoned experiment of 1905 did not include that essential element. This, we think, was the salient reason why Leake's 1905 experiment was an abandoned failure and why the world had to wait for McMichael to produce a practical pneumatic concrete placer.

These Suits Involving the McMichael Patent Are Distinguished From Concrete vs. Gomery, 269 U. S. 177.

The structure of the Callahan patent involved in the Gomery case was *not new*. What Callahan did was to apply an old and substantially unchanged machine to a new use, *i. e.*, the gravitation of concrete through inclined chutes. This court held the Callahan patent invalid.

But the machine of the McMichael patent is a *new machine*. Nowhere in the prior art can there be found a machine which comprises a velocity nozzle acting upon a mass of concrete at the point where it is compacted in passing from a container into a discharge conduit. Therefore, there is not in the prior art a single machine capable of handling concrete as it is handled by the McMichael machine. Since the machine of the McMichael patent is a

new machine, both structurally and in the manner of its operation, it follows that the rule in the Gomery case does not apply.

The Court of Appeals for the Second Circuit was clearly right when, in the Powers-Kennedy case, it distinguished the McMichael patent from the rule in the Gomery case, and Judge Bourquin and the Ninth Circuit Court of Appeals erred in holding to the contrary.

McMichael's Original Application Adequately Supported the Claims in Suit—No Supplemental Oath Was Necessary.

It is, of course, true that McMichael, during the prosecution of his application, largely rewrote and amplified its descriptive part more accurately to set forth his *method* and *theory* of operation. But never at any time did McMichael add to or detract from the *apparatus* shown in his patent drawing. The apparatus is identically the same as it was when the application was filed on January 14, 1907.

If *method claims* were involved in this suit, as was the case in the Eastern suits, the amendments to the specification pertaining to *methods* and theories would undoubtedly require the same careful consideration which was given to them by the judges in the Eastern cases. And in passing upon the method claims now before this court in the Powers-Kennedy case, we are confident that your Honors will agree with the opinion of Judge Learned Hand in the Ulen case, citing *Westinghouse* v. *Metropolitan*, 290 Fed. 661 (Exhibit Book, p. 15), that no adequate defense, even as to *method claims*, can be predicated upon the file-wrapper history of the McMichael application.

But in this case, *apparatus claims* only are involved.

No matter how many times McMichael may be said to have changed his *theories* or ideas as to *method*, the *apparatus* always has been and now is the identical apparatus which was illustrated by McMichael in his original application.

Since McMichael never in any way changed the illustration of his apparatus, it follows that no supplemental oath was at any time necessary to support the apparatus claims involved in this case. Although such a supplemental oath was filed, and was perhaps desirable from the standpoint of McMichael's *method claims*, the fact is that such supplemental oath is mere surplusage so far as the *apparatus claims* involved in this case are concerned.

It will also be observed that claim 3 of the original application covers substantially the same subject-matter as some of the claims (see claim 2) of the patent.

Tested by the Rule Laid Down by This Court in the Eibel Process Case, the McMichael Patent is Entitled to Liberal Construction.

In the case of *Eibel Process Co.* v. *Minnesota & Ontario Paper Co.*, 261 U. S. 45, 63; 43 Sup. Ct. Rep. 322, Mr. Chief Justice Taft says:

> ". . . **In administering the patent law the court first looks into the art to find what the real merit of the alleged discovery or invention is, and whether it has advanced the art substantially. If it has done so, then the court is liberal in its construction of the patent, to secure to the inventor the reward he deserves.** If what he has done works only a slight step forward, and that which he says is a discovery is on the border line between mere mechanical change and real invention, then his patent, if sustained, will be given a narrow scope, and infringement will be found only in approximate copies

of the new device. It is this differing attitude of the courts toward genuine discoveries and slight improvements that reconciles the sometimes apparently conflicting instances of construing specifications and the finding of equivalents in alleged infringements."

Tested by the rule above laid down, the McMichael patent is entitled to liberal construction—easily a construction which will sustain the patent and include the respondents' devices.

That the McMichael apparatus possesses great merit and that it did greatly advance the art of concrete placement cannot seriously be denied. It is the only machine that has ever been successfully used in placing concrete in inaccessible forms, such as those used in lining tunnels. It has been used on practically every important tunnel project in recent years. It has rendered obsolete the hand placement of concrete in tunnel linings. It eliminates the necessity for hand tamping, and packs the concrete which it places much more compactly than any amount of hand tamping could possibly accomplish. It has saved hundreds of thousands of dollars to the builders of tunnels.

No practical substitute for McMichael's essential combination and arrangement of parts has ever been proposed. Now, many years after McMichael's invention, respondents, in order to line a tunnel successfully, are obliged to use each and every element of McMichael's patented combination in exactly the way taught by McMichael, that is to say, so that the *velocity nozzle acts upon the concrete at the very point where it is compacted in passing, under the pressure behind it, from the converging walls of the container into the conduit.*

McMichael's Patent for An Invention of Merit Not Anticipated by Theoretical Modifications of Earlier Devices.

Among all the prior patents relied upon by the respondents in this case there is not shown a single device which without modification, can be made successfully to handle ordinary concrete pneumatically. There is in the prior patents no device which handles concrete as does the McMichael machine, that is to say, by first compacting a mass of concrete at the junction of container and conduit and then acting upon the compacted mass with a velocity nozzle. For the respondents to say now, in the light of McMichael's invention, that it would be possible, or even easy, to provide some one of the prior devices with a velocity nozzle located where and for the purpose taught by McMichael, and otherwise to modify these old devices to make them more or less like McMichael's successful machine, is insufficient.

The leading Supreme Court case on this point is *Topliff* v. *Topliff*, 145 U. S. 156, 161; 36 L. Ed. 658; 12 S. C. 825, wherein Mr. Justice Brown makes the statement:

> "It is not sufficient to constitute an anticipation that the device relied upon might, by modification, be made to accomplish the function performed by the patent in question, if it were not designed by its maker, nor adapted, nor actually used, for the performance of such functions."

The Exercise of Invention by McMichael in Producing His Successful Machine Is Not Negatived by the Simplicity of His Structure or Because That Which He Did May Seem Obvious in the Light of His Achievement.

Although the McMichael machine is necessarily a bulky apparatus, its construction is extremely simple. The construction is simple because McMichael ascertained exactly what was necessary. He provided what was necessary and no more. But simple as is McMichael's construction, nothing like it is to be found in the prior art. The mere simplicity of McMichael's machine is evidence that he made an invention of a high order.

In the case of *Diamond Rubber Co.* v. *Consolidated Tire Co.*, 220 U. S. 428, 435, the Supreme Court, by Mr. Justice McKenna, said:

> "Knowledge after the event is always easy, and problems once solved present no difficulties, indeed, may be represented as never having had any. . . . But the law has other tests of the invention than subtle conjectures of what might have been seen and yet was not. *It regards a change as evidence of novelty the acceptance and utility of change as a further evidence, even as demonstration.*"

As far back as the early case of *Sickles* v. *Gloucester Mfg. Co.*, 1 Fish. 222, the courts have said:

> "But it is not an unusual case, even among learned engineers, to see a thing after it is done, which never occurred to their minds before. I am disposed to distrust that wisdom which succeeds the event."

In the case of *Webster Loom Co.* v. *Higgins*, 105 U. S. 580, 591, in which case it was urged that the production of the meritorious invention there in suit was but an

obvious modification of a previous invention, this court said:

> "But it is plain, from the evidence and from the very fact that it was not sooner adopted and used, that it did not, for years, occur in this light to even the most skilful persons. It may have been under their very eyes, they may almost be said to have stumbled over it; but they certainly failed to see it, to estimate its value, and to bring it into notice. Who was the first to see it, to understand its value, to give it shape and form, to bring it into notice and urge its adoption, is a question to which we shall shortly give our attention. At this point we are constrained to say that we cannot yield our assent to the argument, that the combination of the different parts or elements for attaining the object in view was so obvious as to merit no title to invention. *Now that it has succeeded, it may seem very plain to anyone, that he could have done it as well. This is often the case with inventions of the greatest merit.*"

The Opinion of the Supreme Court in the Grant Tire Case Is Particularly Applicable to the Case at Bar.

In the case of *Diamond Rubber Co.* v. *Consolidated Rubber Tire Co., supra,* the Supreme Court said:

> "The prior art was open to the rubber company (defendant). That 'art was crowded,' it says, 'with numerous prototypes and predecessors' of the Grant tire, and they, it is insisted, possessed all of the qualities which the dreams of experts attributed to the Grant tire. And yet the rubber company uses the Grant tire. It gives the tribute of its praise to the prior art; it gives the Grant tire the tribute of its imitation, as others have done. And yet the narrowness of the claims seemed to make legal evasion easy. Why, then, was there not evasion by a variation of the details of the patented arrangement. Business interests urged to it as much as to infringement. We can find no answer except that given by the tire company:

> " 'The patented organization must be one that is essential. Its use in the precise form described and shown in the patent must be inevitably necessary.' "

In the case at bar the respondents say the conveyor art was crowded and that McMichael's machine had many prototypes in the prior art, as for example, the unused and unusable contraption of the old Smith patent No. 122,498 of 1872, the mud pumps of the Duckham British patents, the kinetic conveyor of the Kolsche German patent, etc. And to these devices of the prior art the respondents give the tribute of their praise. But to the McMichael patent they pay the tribute of imitation, as did the defendants in the Ulen and Powers-Kennedy cases.

It would have been easy for the respondents to have avoided McMichael's claims, if McMichael's specific combination did not possess some peculiar advantage which was desired by his imitators. They could have left out McMichael's velocity nozzle, or they could have placed a nozzle somewhere other than where McMichael taught that it should be placed, *i. e.*, at the specific place where the concrete is compacted in passing from the tapering walls of the container into the conduit. But no! Rather than risk in their business the insufficient combinations of the prior art, the respondents chose to risk this suit and place their velocity nozzle just where McMichael taught that it should be placed, and otherwise appropriate the essential elements of McMichael's combination.

It can be said of McMichael's combination or organization, just as it was said by this court with respect to the Grant tire:

> **"The patented organization must be one that is essential. Its use in the precise form described and shown in the patent must be inevitably necessary."**

A New or Better Theory of Operation Properly May Be Added to a Specification in the Prosecution of An Application for Patent.

At the time McMichael filed his application for patent, his apparatus was new. Even McMichael had had very little experience with it. He knew that it would do something which no prior device had ever done. It would successfully handle concrete pneumatically. Doubtless his *theories* as to the functioning of the machine were incomplete or even faulty. But that is immaterial. It is the thing and its results which count. The theory is unessential.

When McMichael filed his application, he did all that the law requires. He illustrated his essential combination and taught the world how to use it. His combination of parts has not been altered in any substantial respect since his application was filed. In the years following the filing of his application, it was inevitable that McMichael and his associates, upon the basis of their practical experience with his machine, should evolve some *theories* as to why his apparently very simple structure would do something which engineers had always considered impossible of successful accomplishment, *viz.*, the transportation of concrete without separation of its aggregates. When the theories were formulated, they were included in the patent specification, and properly so, because they are instructive to persons skilled in the art.

In the case of *Hobbs* v. *Beach*, 180 U. S. 383, 45 L. Ed. 586, the Supreme Court by Mr. Justice Brown, said:

> "The patent had been the subject of an earnest contest in the Patent Office for four years; had been put in interference with five other devices, and it was scarcely possible that, after this long litigation, the patentee should not have detected defects in his original application, and have taken this opportunity

of correcting them. His experience in this litigation had doubtless apprised him of the weak points in his prior specification and claims, and it was perfectly competent for him to restate them, provided his patent was not essentially broadened to cover intervening devices."

And in the case of *Diamond Rubber Co.* v. *Consolidated Rubber Tire Co.*, 220 U. S. 428, 435, the Supreme Court said:

"A patentee may be baldly empirical, seeing nothing beyond his experiments and the result; yet if he has added a new and valuable article to the world's utilities, he is entitled to the rank and protection of an inventor. And how can it take from his merit that he may not know all of the forces which he has brought into operation? It is certainly not necessary that he understand or be able to state the scientific principles underlying his invention, and it is immaterial whether he can stand a successful examination as to the speculative ideas involved. . . . (Citing numerous cases.) . . . He must, indeed, make such disclosure and description of his invention that it may be put into practice. In this he must be clear. He must not put forth a puzzle for invention or experiment to solve, but the description is sufficient if those skilled in the art can understand it. This satisfied the law, which only requires as a condition of its protection that the world be given something new and that the world be taught how to use it. It is no concern of the world whether the principle upon which the new construction acts be obvious or obscure, so that it inheres in the new construction." (55 L. Ed. 527, 530.)

See also *Cleveland Co.* v. *Detroit Co.*, C. C. A., 6th, 131 Fed. 853, 857, wherein claims based on a better understanding of the invention obtained during the prosecution of the application, were upheld.

The Fact That the Respondents Have a Later Patent Under Which They Purport to Operate Is Not in Any Degree Indicative of Non-Infringement.

Hackley, respondents' expert, who was also superintendent of the infringing operations in the Skagit tunnel, has a patent (Exhibit Book, p. 78) upon certain details of machine which unquestionably embodies all of the essential features covered by McMichael's earlier and more fundamental patent. The grant of the later and narrower patent does not create the slightest presumption that the structure therein shown avoids infringement of the earlier and broader patent.

In the case of *Herman* v. *Youngstown Car Mfg. Co.*, 191 Fed. 579, 584, the Circuit Court of Appeals for the Sixth Circuit by Judge Denison, said:

> "Defendant's device is manufactured under patent No. 765,406, issued July 19, 1904, to J. H. Wagenhorst, and the court below gave to this fact some force in reaching his conclusion that the device did not infringe. **We think that the granting of the later patent and defendant's conformity thereto are not of importance in this case on the infringement issue.** There are expressions in some reported cases implying that by the later patent the government has granted a right to make and use the article so patented and that such grant is inconsistent with any construction of the earlier patent which would forbid the manufacture of the later structure. Such implication rests on a fundamental error. A patent is not the grant of a right to make or use or sell. It does not, directly or indirectly, imply any such right. It grants only the right to exclude others. The supposition that a right to make is created by the patent grant is obviously inconsistent with the established distinctions between generic and specific patents, **and with the well-known fact that a very considerable portion of the patents granted are in a field covered by a former relatively generic or basic patent, are tributary to such earlier patent, and cannot be practiced unless by license thereunder.**"

Conclusion.

McMichael provided the first pneumatic apparatus which would successfully transport and place the heavy non-flowing heterogeneous material commonly known as concrete. His invention has met with unusual success. It has entirely supplanted the hand placement of concrete in the arches of tunnels, subways and similar projects.

Prior to the McMichael invention persons familiar with the characteristics and requirements of concrete believed that it could not possibly be transported through pipes by air pressure without separating its aggregates or without mixing it with so much water as to entirely ruin it. McMichael solved the problem because his machine was constructed to operate in accordance with a plan or principle which was entirely new in the pneumatic conveyor art. He did not apply any old machine to a new use. By an extremely simple arrangement of elements co-operating in a novel manner he produced a new machine having a novel mode of operation,—he transported concrete pneumatically in a way that neither concrete nor any other material had ever been conveyed before.

The decree of the Ninth Circuit Court of Appeals should be reversed.

Respectfully submitted,

LYNN A. WILLIAMS,
CLIFFORD C. BRADBURY,
ALBERT G. MCCALEB,
For Petitioner.

STEPHEN J. COX,
Of Counsel.

APPENDIX

CONTAINING

I. A chart (and comment) showing the presence of the "Velocity Nozzle" in concrete placers made **after** McMichael's invention and the absence of such a nozzle from every one of the prior art structures.

II. A discussion of the experts' tests of the "Slug Theory."

APPENDIX

CONTAINING

I. A short (and rough) drawing the pressure of the Atlantic Ocean in consequences made after Mr. Medhurst's invention and the absence of such a thing from the time of the first discovery.

II. A discussion of the relative merits of the "Blue Theory"

THE VELOCITY NOZZLE.

It Acts Upon the Concrete Which Is Compacted Into the Outlet Where the Conduit and the Tapering Walls of the Container Merge.

It is An Indispensable Feature of Petitioner's Commercial Machine, Each of Respondents' Machines, and Each of the Two Machines Heretofore Held to Infringe the McMichael Patent.

It is Not Disclosed By a Single One of the Prior Art Machines on Which the Respondents Rely.

For the convenience of the court, we are inserting at this point a chart whereon, in the upper row, appear the machines which embody the McMichael invention, and upon which the claims in suit are readable. In the lower row appear the principal prior art devices upon which the respondents rely.

Each of the machines of the upper row, namely, the device of the McMichael patent, petitioners' commercial embodiment of the McMichael invention, respondents' devices, and the devices which were held to infringe in the Ulen and Powers-Kennedy cases, employs a *velocity nozzle* at the very point where McMichael taught that it should be placed, viz., at the point where the concrete tends to arch and jam in passing from the tapering portion of the chamber into the discharge conduit. The claims in suit accurately describe these machines. Each is a successful concrete placing machine, because it embodies every element of McMichael's essential combination. Each would fail as a concrete placer if it were stripped of its velocity nozzle.

No one of the several prior art machines in the lower row comprises a velocity nozzle. Thus it conclusively appears that no one of these prior art devices anticipates the claims in suit, because each and every of the claims clearly and definitely calls for the velocity nozzle.

The devices shown in the upper row represent successful concrete placing machines made **after** McMichael's invention and in accordance with his teaching.

The devices shown in the lower row cannot successfully be used for placing concrete. Why? One sufficient reason why they cannot be so used, is because each and every of these prior art devices is without a velocity nozzle. Being without McMichael's essential nozzle, these prior devices cannot function as does the McMichael apparatus and cannot afford the results which were afforded for the first time when McMichael invented his essential combination.

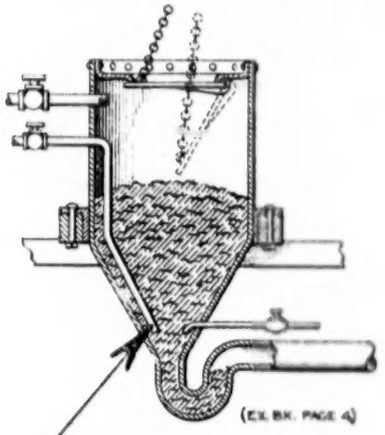
It is indeed significant, in fact conclusive so far as this case is concerned, that defendants use McMichael's essential combination, velocity nozzle and all, exactly as called for by the claims in suit. No one does or can successfully use the devices of the prior art for placing concrete. Can it fairly be said that these devices of the "prior art," totally lacking the velocity nozzle among other things, are sufficient to meet respondents' exigencies in this case, when they are insufficient to meet their requirements in practical tunnel lining operations? We submit that the answer to this question is "No."

The device of the Leake sketch, which is reproduced on the chart, is not a part of the prior art because not proved. However, even if in the prior art it would be of no importance in this case. It had no velocity nozzle. Therefor it was an abandoned failure.

MACHINES W

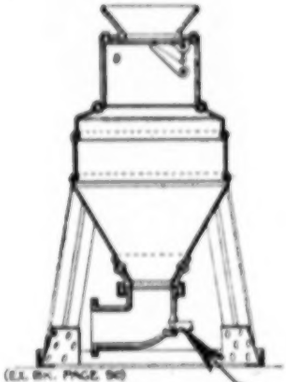
Each of These Machines Has a Velocity

McMICHAEL PATENT.



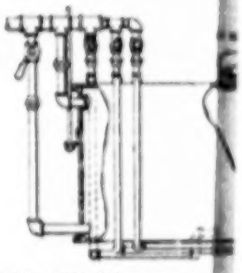
(EX. BK. PAGE 4)

PETITIONER'S COMMERCIAL MACHINE.



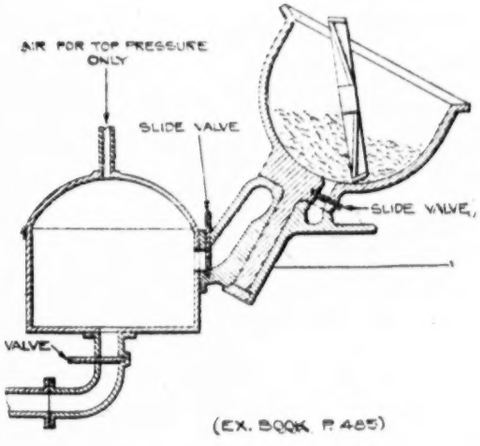
(EX. BK. PAGE 96)

RESPONDENT'S
(Seen by Oxo



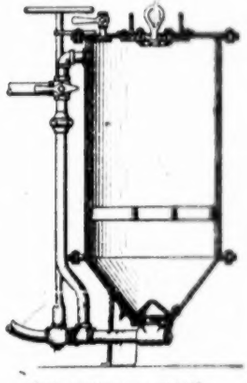
(EX. BK. PAGE 64)

SMITH PATENT #122498.



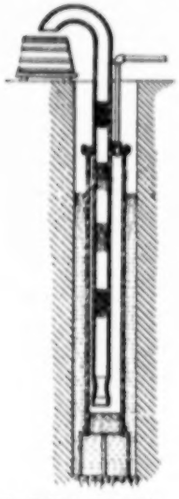
(EX. BOOK P. 485)

CANNIFF PATENT #873345



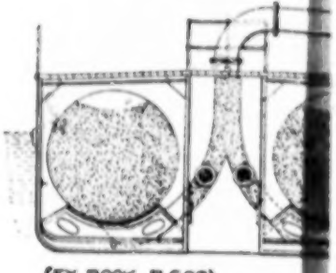
(EX. BOOK P. 544)

SAUNDERS PATENT #597023
(WATER LIFT).



(EX. BOOK P. 572)

DUCKHAM BRITISH PAT

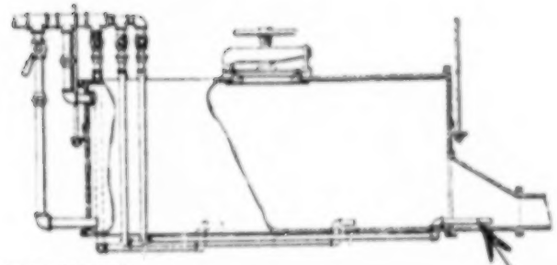


(EX. BOOK P. 603)

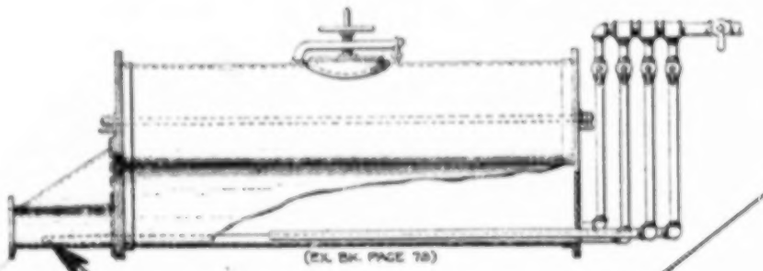
MACHINES WHICH EMBODY THE McMICHAEL INVENTION.

se Machines Has a Velocity Nozzle Discharging Where the Concrete Is Compacted in Passing From the Container into the Conduit.

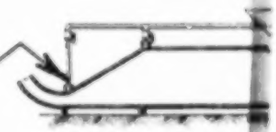
RESPONDENTS' EARLY DEVICE.
(Seen by Oxenham on Oct. 10, 1923).



THE DEVICE OF THE HACKLEY PATENT.
(Also Used on Skagit River Job).



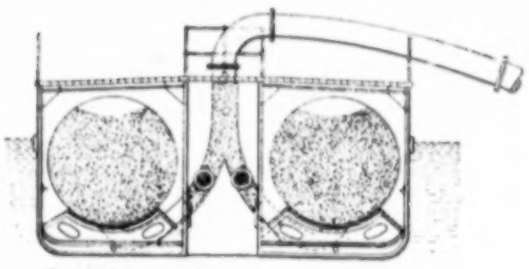
DEVICE HELD TO INFR



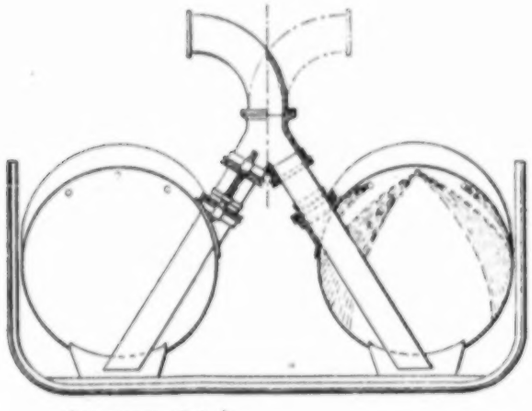
THE VELOCITY NOZZLE

—THE PRIOR ART MACHINES—

DUCKHAM BRITISH PATENT #4400-1875.

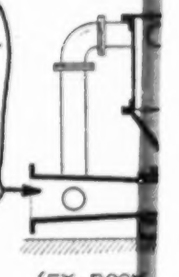


DUCKHAM BRITISH PATENT #15348-1885.



KOLSCHE GERMA

A BLOWER (FAN) CONNECTS HERE TO CREATE A CURRENT WHICH PICKS UP AND CARRIES IN SUSPENSION PARTICLES DROPPING FROM THE HOPPER.

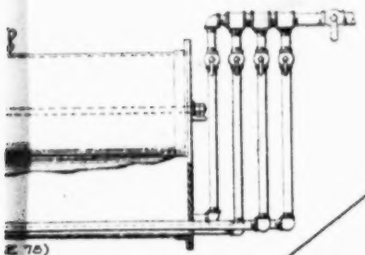


NOT A SINGLE PRIOR ART MACHINE HAS A "VELOCITY NOZZLE"

'ENTION.

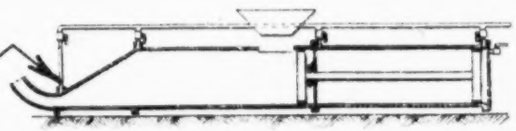
ıssing From

.OKLEY PATENT.
. River Job).



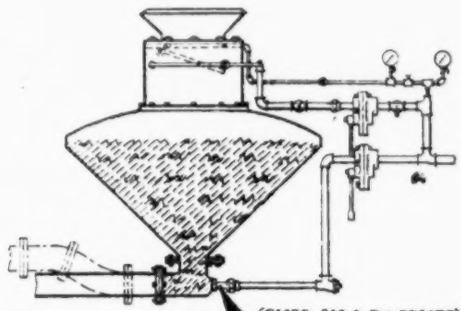
E 78)

DEVICE HELD TO INFRINGE IN ULEN CASE.



(PAGE 181 – ULEN RECORD)

DEVICE HELD TO INFRINGE IN POWERS-KENNEDY CASE.



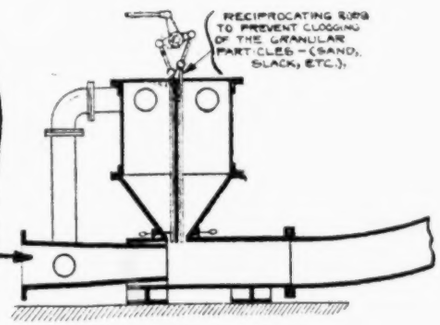
(PAGES 382-3 RK. RECORD)

:S —

348-1885.

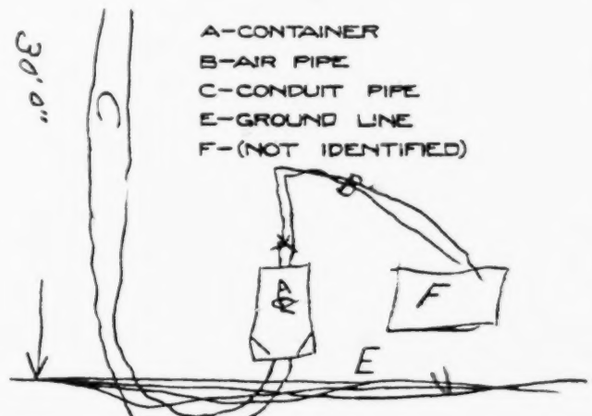
KOLSCHE GERMAN PATENT #18394-1881.

A BLOWER (FAN) CONNECTS HERE TO CREATE A CURRENT WHICH PICKS UP AND CARRIES IN SUSPENSION PARTICLES DROPPING FROM THE HOPPER.



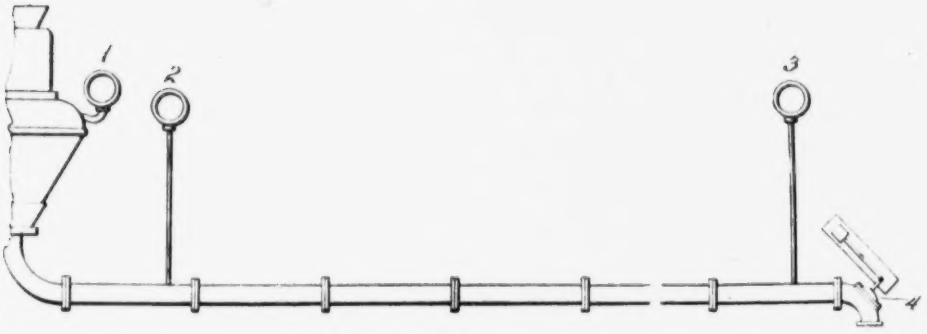
(EX. BOOK P. 659)

LEAKE'S 1927 SKETCH OF ALLEGED 1905 NEW ORLEANS DEVICE A FAILURE – NO VELOCITY NOZZLE.

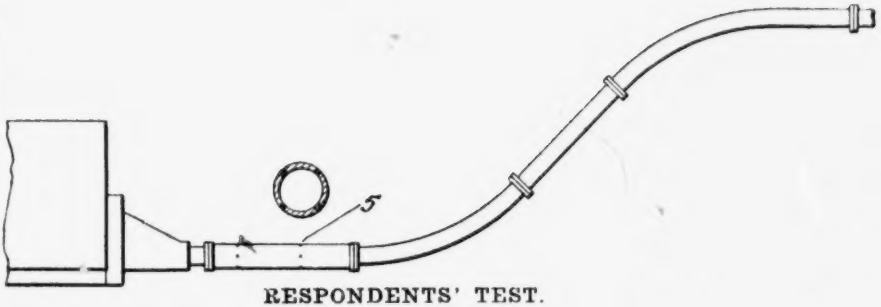


DEFTS' PHYSICAL EX. 127

PLATE ONE.



PETITIONER'S TEST.



RESPONDENTS' TEST.

A DISCUSSION OF THE EXPERTS' TESTS OF THE "SLUG THEORY."

Experts for the respondents and an expert for the petitioner made tests to determine the mode of operation of respondents' and petitioners' machines, particularly with respect to the presence or absence of slugs. Petitioner contends that the only reasonable interpretation of these tests conclusively proves the presence of slugs of almost identical characteristics in both of these tests.

On Plate One are diagrammatic illustrations of petitioners' (above) and respondents' (below) apparatus for conducting these respective tests. Each used full-sized commercial concrete machines which should have given like results.

Petitioner contends that the respondents' experts were led to the conclusion that respondents' machine did not deliver its charge in slugs by an erroneous reading and interpretation of respondents' records.

Respondents' test consisted in measuring instantaneous resistance changes between electrodes 5 (Plate One) positioned in the wall of an insulating section of the discharge pipe as a charge of concrete and air was passed through the pipe.

Petitioner's test consisted in measuring instantaneous pressures at successive positions along the discharge pipe and also measuring the impact pressure at an elbow at the end of the discharge pipe as a charge of concrete and air was passed through the pipe.

Respondents' Test.

On Plate Two is a diagrammatic showing of the oscillograph and its connections used in respondents' test. Electrodes D and A near the top of the pipe section (lower right center Plate Two) were connected to one oscillograph "Element No. 2" and electrodes C and B were connected to another "Element No. 3," suitable batteries being included in their circuits. A third "Element No 1" of the oscillograph was connected to a 60 cycle alternating current source to provide a record of elapsed time. The film which in this case was a photographic film 3¼ inches wide, was arranged to move at a substantially constant rate of speed in the direction shown by the arrow at the upper left-hand corner of Plate Two. Defendants' Exhibit 189, is a photographic copy of the oscillograph film which recorded respondents' test.

On Defendants Exhibit 189 the horizontal lines marked A to D and B to C at the left of the strip are base lines traced on the film by spots of light reflected from tiny mirrors mounted upon the oscillograph elements 2 and 3. These elements are suspended in strong magnetic fields. The beams of light from these mirrors are deflected proportionately to the currents passing through the elements just as the pointer of an ammeter is deflected proportionately to the current which passes through its coil excepting that the elements and mirrors of an oscillograph are made so light that they respond to rapid variations of current.

At a position about 9 inches from the left end of Defendants' Exhibit 189, when the rubber pipe was wet by the passage of the first slug of wet concrete, the resistance between electrodes A and D became reduced to the same extent as that between electrodes B and C and the beams of

PLATE TWO

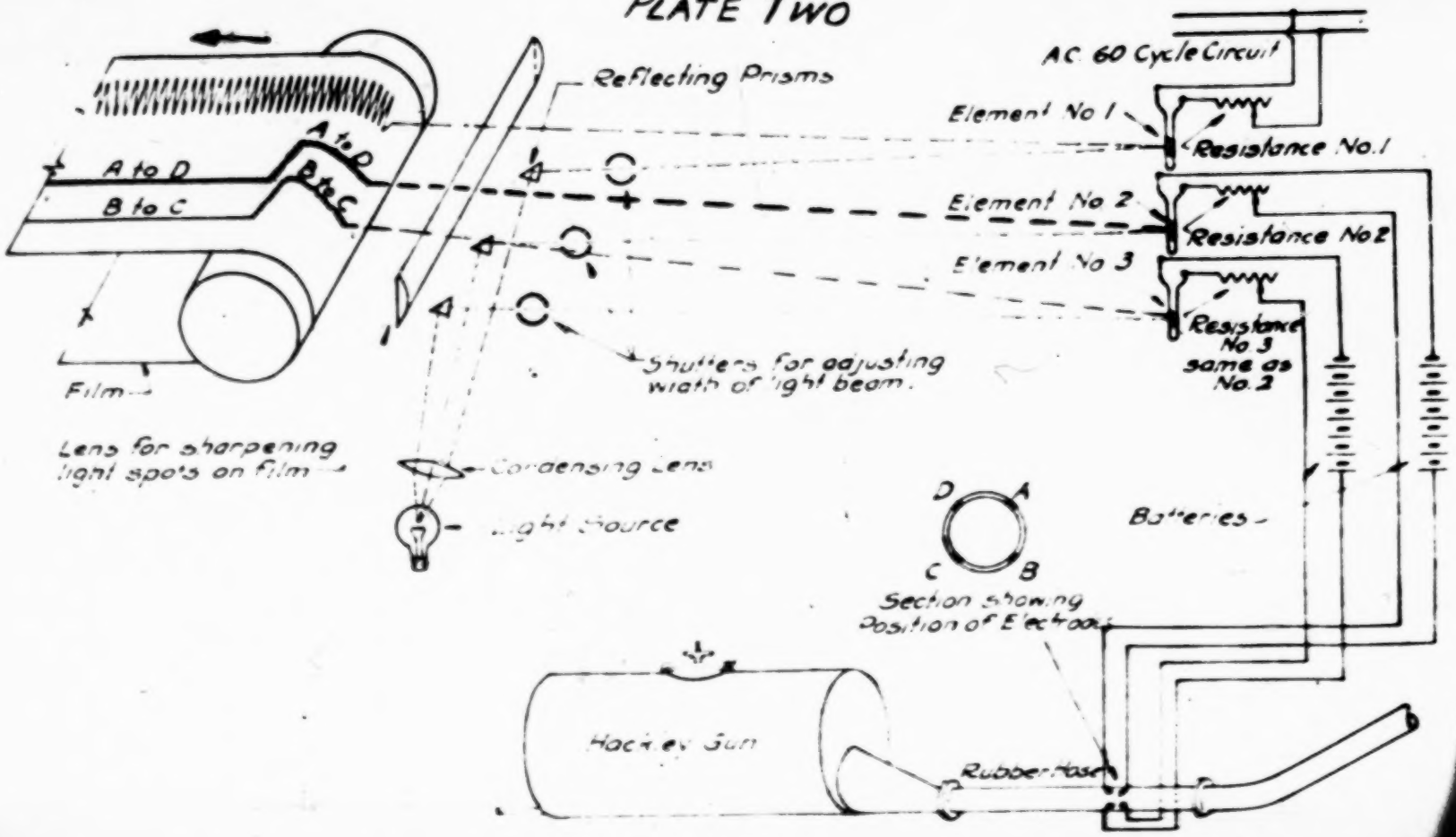
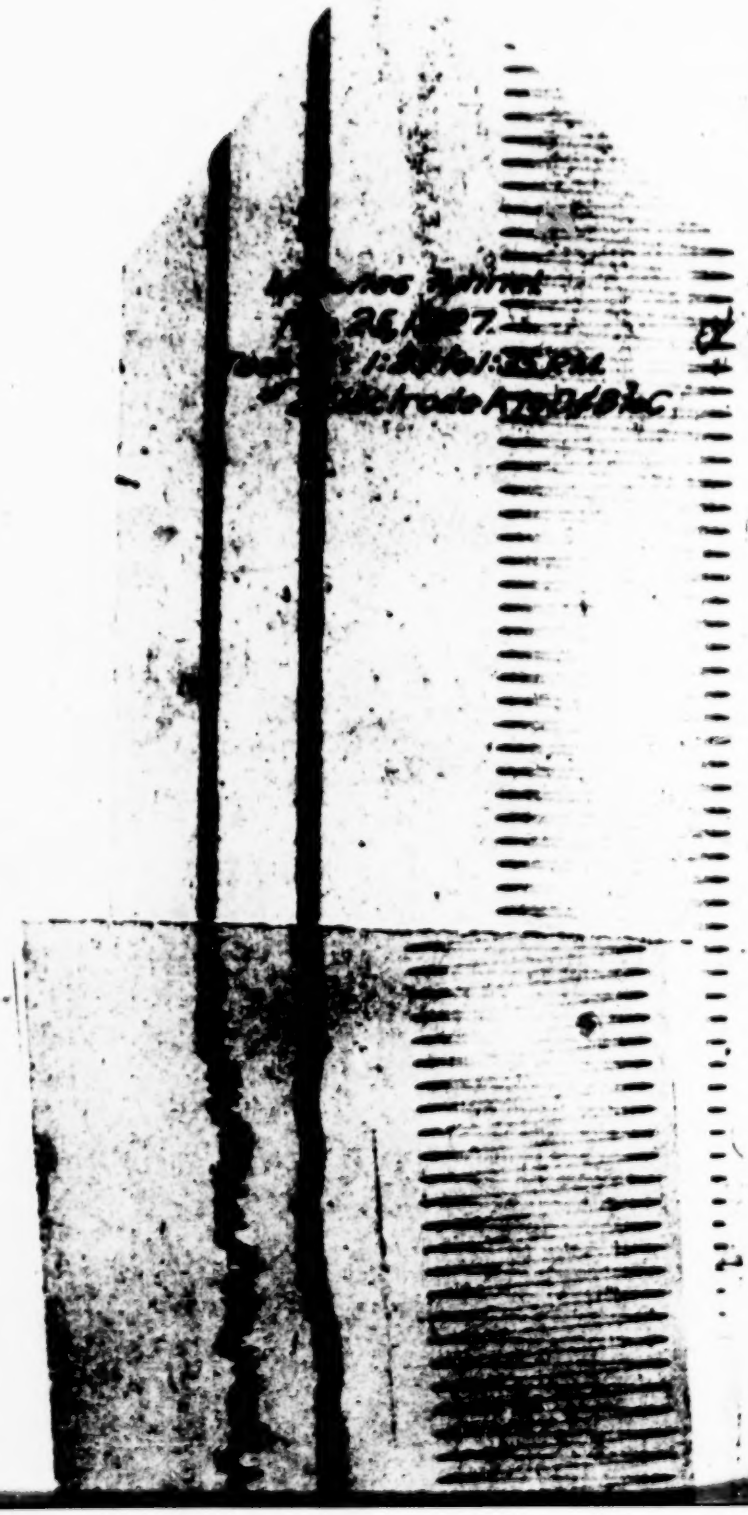

AC 60 Cycle Circuit
Reflecting Prisms
Element No 1
Resistance No.1
A to D
B to C
A to B
B to C
Element No 2
Resistance No 2
Element No 3
Resistance No 3 same as No 2
Shutters for adjusting width of light beam.
Film
Lens for sharpening light spot's on film
Condensing Lens
Light Source
D
A
C
B
Batteries
Section showing position of Electrodes
Hackley Gun
Rubber Hose

PLATE THREE



light were consequently deflected so as to trace new paths upon the moving photographic film. It is here that respondents' experts were deceived. Because the base line A to D, Defendants' Exhibit 189, appeared to extend to the right without an offset at the position 9¼ inches from the left end of line marked A to D, they concluded that the top line to the right of the offset was traced by the same mirror which traced the bottom line to the left of the offset and that the bottom line to the right of the offset was traced by the mirror which traced the top line to the left of the offset.

A careful inspection of Defendants' Exhibit 189, however, shows from the quality and characteristics of the lines traced to the left and to the right of the offset that the top line to the right of the offset is traced by the same spot of light which traced the top line to the left of the offset and that the bottom line to the right of the offset is traced by the same spot of light which traced the bottom line to the left of the offset. The width and brightness of the lines to the left and right of the offset afford a means of comparison which is conclusive that the top line to the right of the offset is traced by the same mirror as the top line to the left and that the bottom line to the right of the offset is traced by the same mirror as the bottom line to the left.

Plate Three was produced by making a fold in Defendants' Exhibit 189 at a position exactly 17⅝ inches to the right of the offset and superimposing the part of Defendants' Exhibit 189 where this fold is made upon the base lines and then photographing the fold. The distance of 17⅝ inches was selected because this is the first position at which the lines to the right of the offset are found to extend for any appreciable time the same distance apart as they were before being offset. If Defendants' Exhibit 189 is folded at the position 17⅝ inches to the

right of the offset and laid back upon the base lines the identity of the lower line to the right with the lower line to the left and the upper line to the right with the upper line to the left will be instantly apparent.

Another proof of respondents' experts' erroneous interpretation of Defendants' Exhibit 189 is that the lower line to the right of the offset has portions which drop below the upper base line to the left of the offset. This could not happen with the use of batteries connected as shown on Plate Two. (Plate Two is a copy so far as the battery connections are concerned, of a plate of respondents' brief before the Ninth Circuit Court of Appeals.) Perhaps the most conspicuous position at which the lower line to the right of the offset drops below the upper base line to the left of the offset is at 27 inches to the right of the offset. The condition may be seen clearly, however, right at the offset where the lower line to the right drops about 1/16 of an inch below the lower edge of the upper base line.

Petitioner's Test.

As the concrete is discharged from the petitioner's machine shown at the top of Plate One, if slugs are formed there will be pressure gauge indications of the passage of the slugs past the connections of the gauges with the pipe line. In order that a slug may move through the pipe line a greater pressure must exist behind the slug than that immediately in front of it. It is this differential of pressure which moves the slug through the pipe line. By having gauges 2 and 3 and the mass recorder 4 synchronized by a half-second time indicator, pressure waves in the pipe line as they occur on the gauge 2 and on the gauge 3 can be traced with particular reference to the time when a mass impinges upon the mass recorder 4

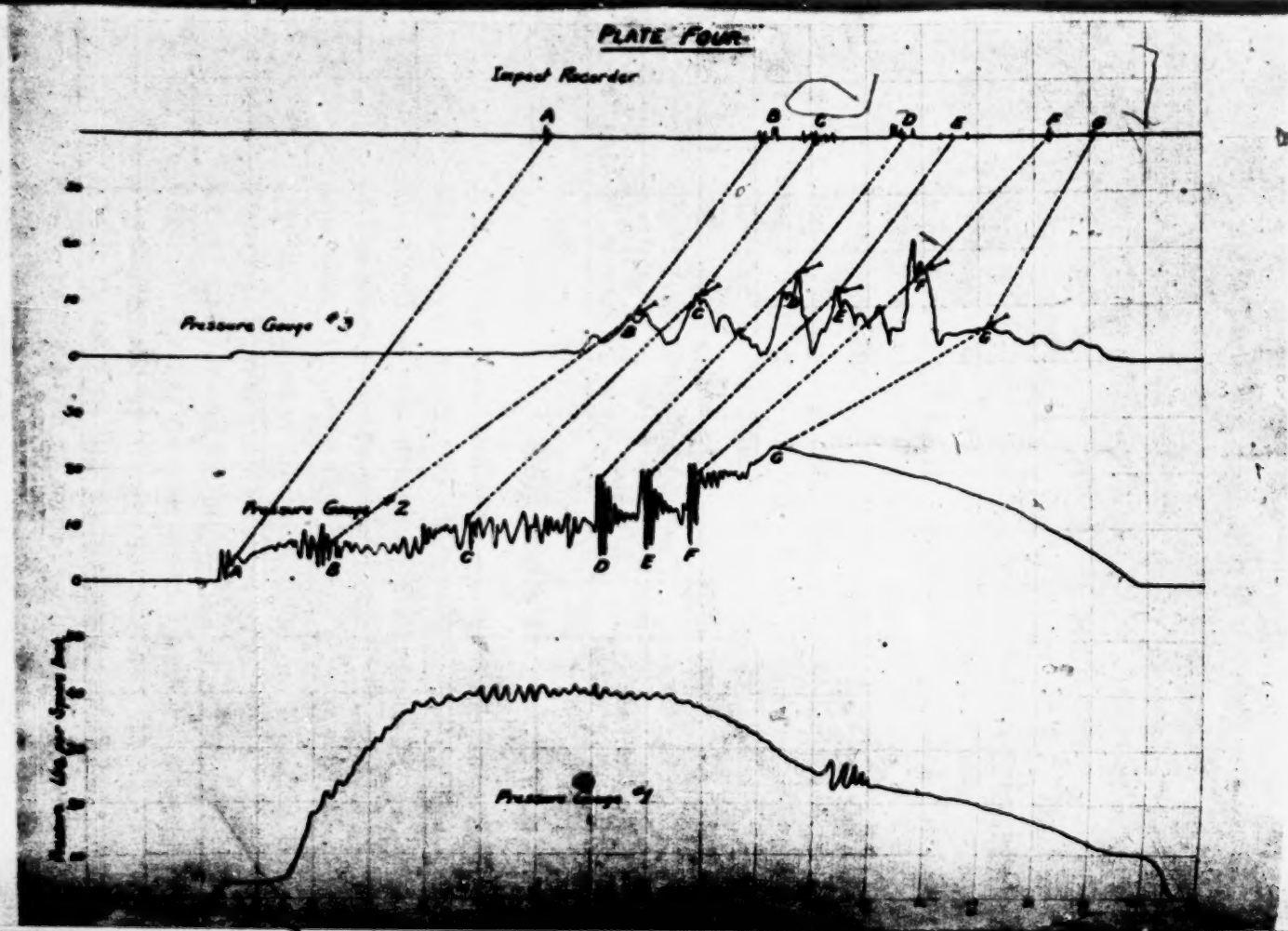


PLATE FOUR
Impact Recorder
A
B
C
D
E
F
G
Pressure Gauge #3
Pressure Gauge #2
Pressure Gauge #4

as the concrete turns around the bend at the discharge end of the pipe.

Four separate discharges from the petitioner's machine were recorded, the actual original records being introduced as Plaintiff's Exhibit 207; but the real information of what happened in the pipe line can be had most accurately from an inspection of Plaintiff's Exhibit 206, which comprises a plurality of composite records of all the recording devices and from which can be seen at a glance just what was occurring in the pipe line. These exhibits were made up by petitioner's expert, Mr. Ray, by taking readings off of the original gauge and mass recording dials and tape. One sheet forming part of Plaintiff's Exhibit 206 is reproduced herewith as Plate Four. (This sheet as shown in Plate Four is modified by the addition of the diagonal lines indicating slugs.) The vertical lines of this plate indicate half-second divisions of time as recorded by a swinging pendulum which made and broke an electric circuit connected with the time recording devices of all of the instruments.

Commencing at the beginning of the discharge of a batch of concrete, the lower line is a record of gauge No. 1 showing the air pressure on top of the concrete in the receiver. The next higher line shows the air pressures on gauge No. 2; the next the air pressures on gauge No. 3; and the top line the mass deflections on the mass recorder.

By reference to this chart, the total number of masses passing through the discharge pipe can be counted, the speed of travel of certain masses can be observed. The fact that there are some large and some small masses is in evidence, and the length of time for the discharge of the entire batch is also observable. Respondents offered no counter explanation for these results and attacked

them solely on the ground that they were not made in the presence of respondents' counsel.

An inspection of this particular exhibit shows that seven major slugs passed through the pipe line in the discharge of this batch of concrete; that a particular slug B passed the gauge 2 on the two-second mark. This same slug passed the gauge 3 on the five-second mark, and impinged upon the mass recorder on the six-second mark, indicating that it required four seconds for this slug to travel the entire length of the discharge pipe. Each of the other major slugs can be traced in this same way and will be found to be traveling at about the same rate of speed.

The fact that the first slug marked A on the chart Plate Four gave no indication on gauge 3 is probably explained by the fact that this slug traveled past the connection with gauge 3 entirely through inertia which the slug had gained in traveling up to or near that position in the discharge pipe. In fact it is probable that the speed of air flow for the first slug is greater than the speed of air flow for subsequent slugs and that for this reason subsequent slugs had somewhat diminished the general air flow in the pipe line by the time the first slug reached the position of gauge No. 3 so that this slug at this position was no longer being impelled by air differential but was at this position being impelled almost wholly by its own inertia set up in the first part of the pipe line. It is also possible that this first slug broke down and lost its piston characteristic prior to its passage past the connection with the No. 3 gauge but that it had a sufficient inertia nevertheless to strike the impact recorder as a mass and thus produce the indication A on the impact recorder tape. This seems to be a reasonable explanation of the fact that all of the other major slugs can be clearly traced on all three gauges.

Respondents' contentions based upon its oscillograph record, Defendants' Exhibit 189, are set forth in Wilkins' testimony (Rec. 445), where respondents' expert Wilkins said, speaking of Defendants' Exhibit 189:

> "The whole film indicates that the flow is practically uniform with a mixture of air which remains the same.
>
> "Q. Do I understand from your testimony then that this oscillograph record, Exhibit 189, represents in the solid line the solid concrete or more solid portion of the concrete?" (Counsel was here referring to the top line to the right of the offset.)
>
> "A. More solid than at the top.
>
> "Q. And that the wavy and broken line represents the upper surface of the flow?
>
> "A. Not the upper surface. It still had concrete in it to carry the current. It had more air and less concrete."

Record 446:

> "Q. What was the result of your findings by these tests?
>
> "A. The general conclusions were that the concrete flowed through the pipe with a proper supply of air practically a uniform mixture of air and concrete, somewhat denser at the bottom."

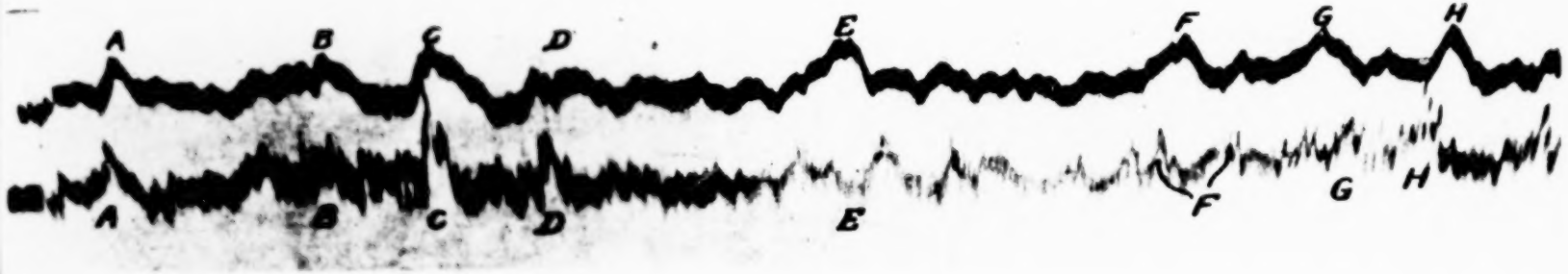
That the line marked A to D on Defendants Exhibit 189 is a base or zero line was testified to by Wilkins (Rec. 444) where he said:

> "When the pipe is completely full the deflection from the zero which is indicated at the start would extend nearly across the film."
>
> "If the concrete went out in plugs or slugs it would give a hump and then drop back to zero and then drop back and give another hump as each went by." (Rec. 443.)

It is to be noted that Defendants' Exhibit 189 although recording twenty and one-half seconds (Rec. 450) in time of the discharge from the concrete machine, does not in fact, record a sufficient length of time for the upper and

lower oscillograph record lines to return to their zero positions. That is, if Defendants' Exhibit 189 is examined clear to the right end of the strip, it will be noted that the broad and narrow record lines are each still offset about one-half inch from their zero or base positions. The reason for this we believe to be quite obvious; the pipe being wet from the passage of concrete, has brought down the resistance between electrodes in the pipe to such a degree that deflection of the light beams of the oscillograph remain offset substantially this one-half inch whether or not any concrete is flowing through. With this understanding the total deflection of the light beams due to the passage of concrete as distinguished from their normal deflection of about one-half inch due to the wetting of the inner surface of the pipe, is relatively small. That is, the lowering of the resistance by the passage of the first concrete, at which time the surface became wet, was sufficient to offset the beam of light substantially one-half inch. Apparently the difference between a mere wet surface and the passage of concrete, made only a sufficient difference in resistance to produce an additional deflection generally small in comparison to the deflection produced by the wet surface alone. Why it is that the record of the changes in resistance between contacts A and D should be less rapid than the changes in resistance between the contacts B and C, petitioners cannot explain but we think that in all probability the difference resulted from differences in the sensitiveness of the oscillograph elements. The least sensitive of the two elements apparently carries a mirror at least twice the size of that carried by the more sensitive element and it is perhaps on account of this increased inertia that the element connected with the contacts A and D, near the top of the pipe, Plate Two, did not record the same rapid variations as

PLATE FIVE



the element connected with contacts B and C near the bottom of the pipe.

At any rate, we think the evidence conclusive that the contacts B-C located at the bottom of the pipe recorded rapid fluctuations in resistance, whereas contacts A-D located near the top of the pipe recorded less rapid variations in resistance.

Respondents' expert Wilkins, in reaching his conclusions based upon the test, wholly ignored the basic deflection of the light beams caused by the wetting of the surface of the pipe and therefore concluded that the condition within the pipe as indicated by the offset of the light beams, was due wholly to the passage of a substantially homogeneous mixture of concrete and air through the pipe. Respondents contend that the major part of this offset is due to the wetting of the inside of the pipe and that the fluctuations from the offset position of about one-half inch due to moisture are due to the passage of slugs of concrete through the pipe.

On Plate Five petitioners illustrate the first seven seconds of the record of Defendants' Exhibit 189 in which the length of the record has been foreshortened by a photographic process from substantially 50 inches down to substantially 8 inches without materially changing the height of the fluctuations. This was done solely to make the fluctuation more plainly noticeable to the eye. It produced exactly the same result as would have been obtained by moving the film more slowly through the oscillograph machine. The points marked A, B, C, D, E, F, G and H on this foreshortened reproduction of part of Defendants' Exhibit 189 are respectively the positions located at A—3¼ inches, B—10 inches, C—13⅜ inches, D—16½ inches, E—27½ inches, F—38 inches, G—42⅝ inches, and H—46⅝ inches from the offset near the left-hand

end of Defendants' Exhibit 189. It is petitioner's contention that during this seven seconds of the discharge of concrete from respondents' machine, seven major slugs of concrete represented by the humps A, B, C, E, F, G and H passed the contacts D and A in the discharge pipe and that one minor slug D also passed these contacts.

By reference to Plaintiff's Exhibit 207 reproduced here as Plate Four, it will be seen that exactly the same number of slugs marked on this Plate Four, A, B, C, D, E, F and G passed through the discharge pipe in petitioners' test in substantially the same length of time as covered by the foreshortened portion of Defendants' Exhibit 189.

In the concrete machine of petitioner's test it is probable that the air pressure was a little higher than in the concrete machine used in respondents' test because it appears that seven slugs of concrete passed the position of gauge 2 of petitioner's test in a total lapsed time of five seconds whereas in respondents' test it required substantially six seconds for the passage of seven slugs of concrete.

Some Common Sense Observations on the "Slug Theory."

Respondents' expert Wilkins testified (Rec. 449) that the speed of travel of the concrete mixture through the discharge pipe was "between 15 and 20 feet a second." Supposing this to have been 17½ feet per second, the speed would have been 1,050 feet per minute or substantially 12 miles per hour.

Respondents' theory is that there is a substantially continuous mixture of air and concrete traveling through this pipe at 12 miles per hour, not in piston form, but kinetically like leaves in a wind.

Is it at all reasonable that a twelve-mile wind could

pick up and carry with it kinetically one-fourth its volume of concrete? Winds traveling twelve miles per hour are encountered almost every day and it is inconceivable that this kind of a breeze could carry with it about one-fourth or one-fifth its volume of concrete.

Petitioner's test, as shown by the chart, Plate Four, demonstrates that respondents' expert Wilkins was about right as to the speed of travel of the concrete through the pipe, that is, the slug B, Plate Four, traveled the 50 feet from gauge 2 to gauge 3 in three seconds, indicating a speed of only slightly less than 20 feet per second through the pipe line. This same slug, however, traveled the last 4 or 5 feet from gauge 3 to the impact recorder in one second and was therefore discharged from the end of the pipe at a very much increased velocity, probably more than one mile per minute. The slug being discharged from the end of the pipe naturally accelerates very rapidly as it approaches the end of the pipe because the differential of pressure on the two sides of the slug being discharged increases rapidly as the slug approaches the end where it is opposed only by atmospheric pressure.

What petitioner contends may be visualized as a number of pistons substantially equally spaced apart in a tube, and discharged from the tube by the application of pressure at one end. Although the average speed of travel of the pistons through the tube may be comparatively small, the discharge speed of each piston as it leaves the end of the tube will be high.

This Honorable Court may give little or no importance to the accuracy of petitioner's "slug theory." It is the theory upon which petitioner believes these concrete machines operate. The important thing is not that petitioner's and respondents' commercial machines operate upon the "slug theory" but that they operate alike. It

has been the aim, therefore, in this appendix to petitioner's brief, to show that petitioner's and respondents' devices perform with the same characteristics, and that to say the least, the "slug theory" is not an untenable explanation of the unexpected but like results obtained from these two differently appearing but identically functioning structures.